LeCroy™ Digital Oscilloscopes

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LC574A Series Service Manual

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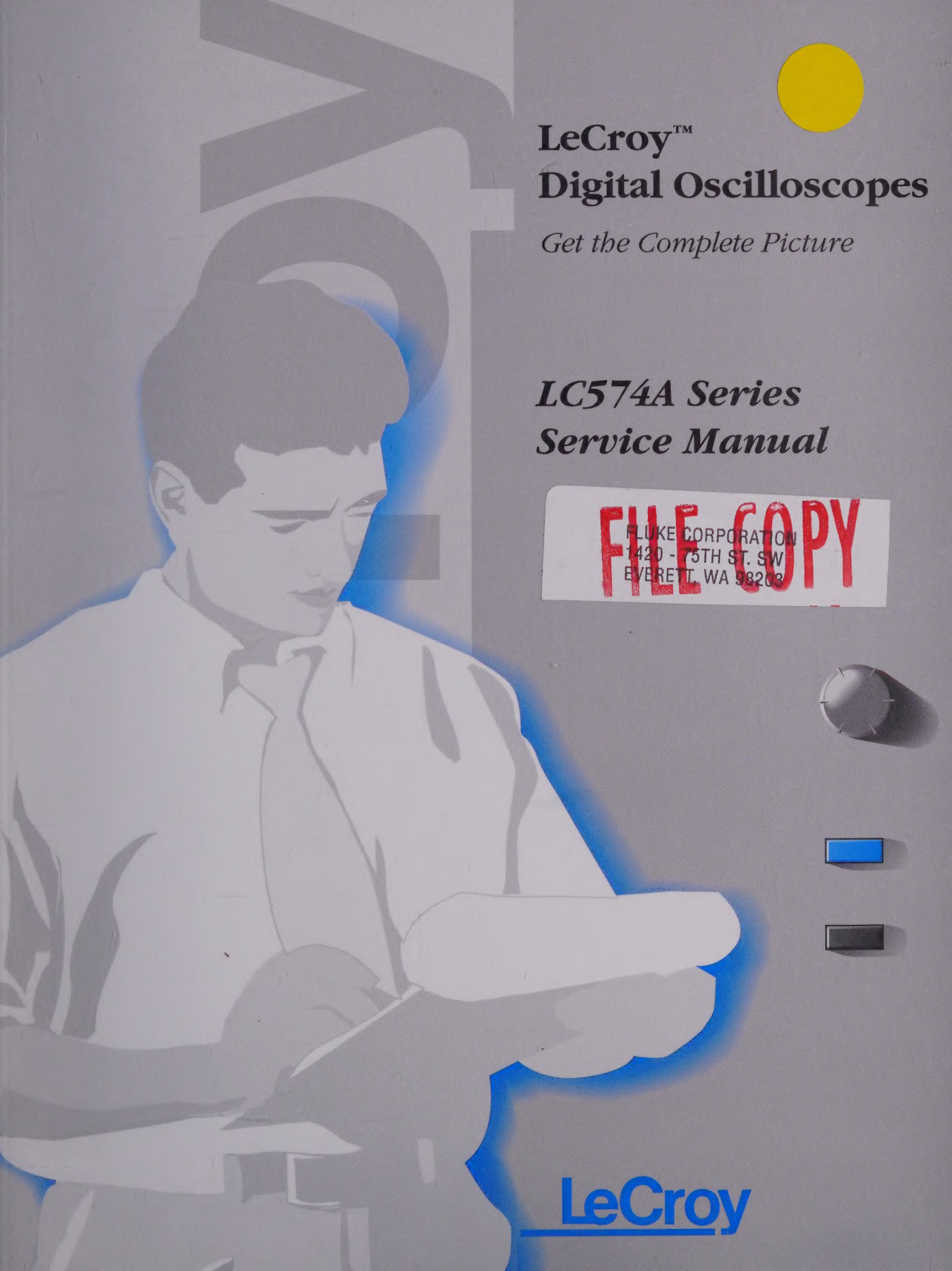

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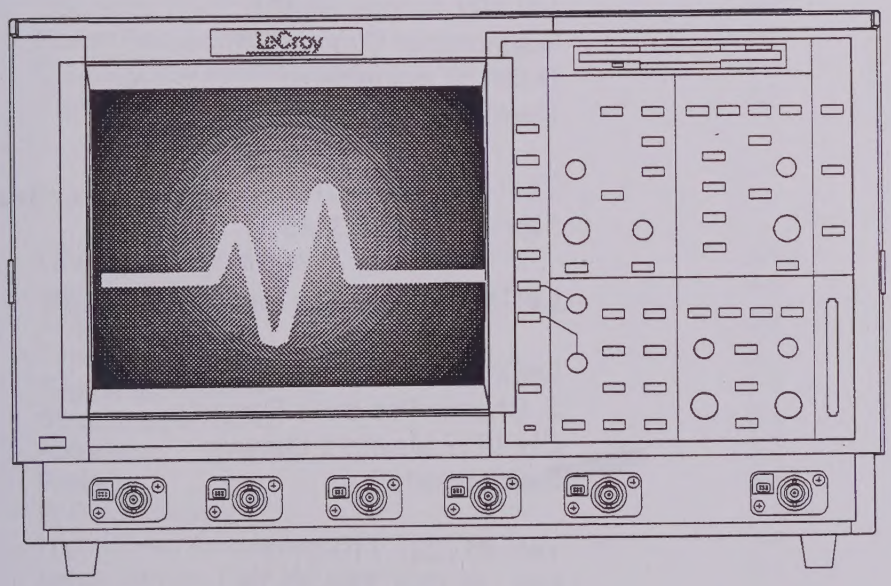
LeCroy Color Digital Oscilloscopes

LC574A, LC574AM & LC574AL

Service Manual



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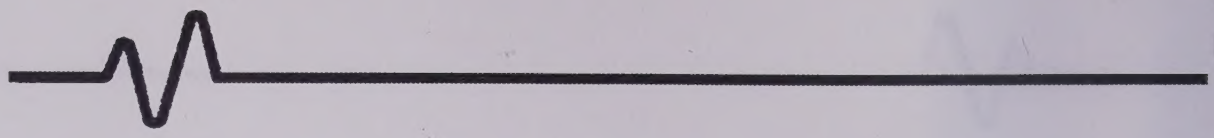

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1. Product and Client Care

1.1 As Soon As Your Scope is Delivered

We recommend you thoroughly inspect the contents of the scope packaging at once. Check all the contents against the enclosed *packing list*. Unless LeCroy is notified promptly of a missing or damaged item, we cannot accept responsibility for its replacement. Contact your national LeCroy Customer Service Department or local office immediately.

1.2 Warranty

LeCroy warrants its oscilloscope products for normal use and operation within specifications for a period of three years from the date of shipment. Calibration each year is recommended to ensure in-spec performance. Spares, replacement parts and repairs are warranted for 90 days. The instrument's firmware has been thoroughly tested and is thought to be functional, but is supplied without warranty of any kind covering detailed performance. Products not made by LeCroy are covered solely by the warranty of the original equipment manufacturer.

In exercising its warranty, LeCroy will repair or, at its option, replace any product returned within the warranty period to the Customer Service Department or an authorized service center. However, this will be done only if the product is determined by LeCroy's examination to be defective due to workmanship or materials, and the defect has not been caused by misuse, neglect or accident, or by abnormal conditions or operation.

The client will be responsible for the transportation and insurance charges for the return of products to the service facility. LeCroy will return all products under warranty with transport prepaid.

This warranty replaces all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability, fitness, or adequacy for any particular purpose or use. LeCroy shall not be liable for any special, incidental, or consequential damages, whether in contract or otherwise.

1.3 Maintenance Agreements

We provide a variety of customer support services. Maintenance agreements give extended warranty and allow our clients to budget maintenance costs after the initial three-year warranty has expired. Other services such as installation, training, enhancements and on-site repairs are available through special Supplemental Support Agreements

1.4 Keeping You Up to Date

LeCroy is dedicated to offering state-of-the-art instruments, continually refining and improving the performance of our products. Because of the speed with which physical modifications may be implemented, this manual and related documentation may not agree in every detail with the products they describe. For example, there might be small discrepancies in the values of components affecting pulse shape, timing or offset, and — infrequently — minor logic changes.

However, be assured the scope itself is in full order and incorporates the most up-to-date circuitry. We frequently update firmware or software during servicing to improve scope performance, free of charge during warranty. We will keep you up to date with such changes, through manuals such as this one and other publications.

1.5 Service and Repair

Please return products requiring maintenance to the Customer Service Department in your country or to an authorized service facility. LeCroy will repair or replace any product under warranty free of charge. The customer is responsible for transportation charges to the factory, whereas all in-warranty products will be returned to you with transportation prepaid.

Outside the warranty period, you will need to provide us with a *purchase order number* before we can repair your LeCroy product. You will be billed for parts and labor related to the repair work, and for shipping.

1.6 How to Return a Product

Contact your country's Customer Service Department or local field office to find out where to return the product. All returned products should be identified by model and serial number. You should describe the defect or failure, and provide your name and contact number. And in the case of products returned to the factory, a *Return Authorization Number* (RAN) should be used. The RAN can be obtained by contacting your nearest LeCroy office, or the New York Customer Care Center or European Manufacturing in Geneva (*see chapter 2 for contact numbers*).

Return shipments should be made prepaid. We cannot accept COD (Cash On Delivery) or Collect Return shipments. We recommend air-freighting. It is important that the RAN be clearly shown on the outside of the shipping package for prompt redirection to the appropriate LeCroy department.

Wherever possible, use the original shipping carton. If a substitute carton is used, it should be rigid and packed so that that the product is surrounded by a minimum of four inches or 10 cm of shock-absorbent material.

2. General Information

2.1 Product Assistance

Help on installation, calibration, and the use of LeCroy equipment is available from your local LeCroy office, or from LeCroy's

- Customer Care Center, 700 Chestnut Ridge Road, Chestnut Ridge, New York 10977–6499, U.S.A., tel. (914) 578–6020
- European Manufacturing, 2, rue du Pré-de-la-Fontaine, 1217 Meyrin 1, Geneva Switzerland, tel. (41) 22/719 21 11.

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2.3 Installation for Safe and Efficient Operation

Operating Environment

The oscilloscope will operate to its specifications if the environment is maintained within the following parameters:

Temperature.....5 to 40 °C (41 to 104 °F) rated.

Humidity.....Maximum relative humidity 80 % RH (non-condensing) for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C

Altitude.....2000 m (6560 ft)

The oscilloscope has been qualified to the following EN61010-1 category:

Installation (Overvoltage) Category II

Pollution Degree.....2

Safety Symbols

Where these symbols or indications appear on the front or rear panels, and in this manual, they have the following meanings:

..... **CAUTION**: Refer to accompanying documents (for Safety-related information). *See elsewhere in this manual wherever the symbol is present,as indicated in the Table of Contents.*

..... **CAUTION**: Risk of electric shock

..... **On (Supply)**

..... **Off (Supply)**

..... **Earth (Ground) Terminal**

..... **Protective Conductor Terminal**

..... **Earth (Ground) Terminal on BNC Connectors**

WARNING ..... **Denotes a hazard. If a WARNING is indicated on the instrument, do not proceed until its conditions are understood and met.**

The oscilloscope has *not* been designed to make direct measurements on the human body. Users who connect a LeCroy oscilloscope directly to a person do so at their own risk.

Power Requirements

The oscilloscope operates from a 115 V (90 to 132 V) or 220 V (180 to 250 V) AC power source at 45 Hz to 66 Hz. No voltage selection is required, since the instrument automatically adapts to the line voltage present.

The power supply of the oscilloscope is protected against short-circuit and overload by means of two 6.3 A/250 V AC, "T" rated fuses (size: 5 X 20 mm), located above the mains plug. Disconnect the power cord before inspecting or replacing a fuse. Open the fuse box by inserting a small screwdriver under the plastic cover and prying it open.

For continued fire protection at all line voltages, replace only with fuses of the specified type and rating (T 6.3 A/250 V).

The oscilloscope has been designed to operate from a single-phase power source, with one of the current-carrying conductors (neutral conductor) at ground (earth) potential.

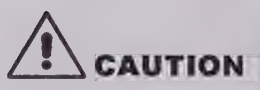
Maintain the ground line to avoid an electric shock.

None of the current-carrying conductors may exceed 250 V rms with respect to ground potential. The oscilloscope is provided with a three-wire electrical cord containing a three-terminal polarized plug for mains voltage and safety ground connection.

The plug's ground terminal is connected directly to the frame of the unit. For adequate protection against electrical hazard, this plug must be inserted into a mating outlet containing a safety ground contact.

Cleaning And Maintenance

Maintenance and repairs should be carried out exclusively by a LeCroy technician (*see* Chapter 2). Cleaning should be limited to the exterior of the instrument only, using a damp, soft cloth. Do not use chemicals or abrasive elements. Under no circumstances should moisture be allowed to penetrate the oscilloscope. To avoid electric shocks, disconnect the instrument from the power supply before cleaning.



Power On

Connect the oscilloscope to the power outlet and switch it on by pressing the power switch located on the rear panel. After the instrument is switched on, auto-calibration is performed and a test of the oscilloscope's ADCs and memories is carried out. The full testing procedure takes approximately 10 seconds, after which time a display will appear on the screen.

3. LC574A Specifications

3.1 Leading Specifications

- 1 GHz Bandwidth
- 4 GS/s Single-shot Sample Rate
- 8 Million Points of Acquisition Memory
- 4 ms Maximum Sample Rate Window
- 96 MHz PowerPC Microprocessor
- 8 to 64 Mbytes System RAM
- 9" Color Display
- Analog Persistence
- Full Screen Grid

Digital oscilloscopes from LeCroy are designed to save engineers valuable time in troubleshooting and problem-solving.
Each oscilloscope is an integrated and powerful system providing the capability to:

- **Capture** the key events with high resolution for longer time intervals
- **View** data like never before, giving you more information more quickly, with a large, color CRT and advanced display techniques
- **Analyze** your signal to get answers quickly and more accurately with a powerful processing system and math packages.

3.2 Signal Capture

Acquisition System
Bandwidth (-3 dB):
@ 50Ω: DC to 1 GHz
@ 1 MΩ DC:DC to 500 MHz typ. at probe tip.
No. of Channels: 4
No. of Digitizers: 4 at 1 GS/s, 4 GS/s single channel mode.
Max. Sample Rate Window: 4 ms @ 4 GS/s in single-shot mode.
Sensitivity:
50Ω : 2 mV/div to 1 V/div
1MΩ : 2 mV/div to 5 V/div
Scale factors: A wide choice of probe attenuation factors are selectable.
Offset Range:

2.0-4.99 mV/div:	±400 mV
5.0-99 mV/div:	±1V
.100-1.0 V/div:	±10V
1.0-10.0 V/div:	±100 V (1MΩ only)

DC Accuracy: 1% typical; guaranteed ≤ ±2% full scale at 0 V offset.
Vertical Resolution: 8 bits.
Bandwidth Limiter: 25 MHz, 200 MHz.

Input Impedance: 1MΩ//11pF (system capacitance using PP005 or 50 Ω ±1%.
Max Input:
50 Ω: ±5 V DC (500 mW) or 5 V RMS.
1 MΩ: 400 V (DC+ peak AC ≤10 kHz).

Channel use	Maximum Sample Rate	LC574A	LC574AM	LC574AL	Active Channels
All Peak Detect Off	1 GS/s	100 k	500 K	2 M	All
Paired Peak Detect Off	2 GS/s	250 k	1 M	4 M	Ch2&Ch3
Paired+Adapter Peak Detect Off	4 GS/s	500 k	2 M	8 M	One
All Peak Detect On	100 MS/s data + 400 MS/s peaks	50 k data + 50 k peaks	250 k data + 250 k peaks	1 M data + 1 M peaks	All

SMARTMemory: This total memory management system dynamically manages acquisition memory to guarantee that signals are always sampled at the highest possible sample rate and that system RAM and microprocessor power resources are always optimally employed.

3.3 Acquisition Modes

Random Interleaved Sampling (RIS):
For repetitive signals from 1 ns/div to 2 µs/div.
Single shot:
For transient and repetitive signals from 1 ns/div (all channels active).
Peak detect: At 400MS/s, peak detect can capture high-speed events down to 1ns, while simultaneously capturing normally sampled data.
Sequence: Stores multiple events in segmented acquisition memories.
Dead Time between segments: Typically < 30 µs, max. 50 µs.

Number of segments available:
LC574A : 500.
LC574AM : 2,000.
LC574AL : 2,000.

3.4 Timebase System

Timebases: Main and up to 4 Zoom Traces.
Time/Div Range: 1 ns/div to 1,000 s/div.
Clock Accuracy: ≤10 ppm.
Interpolator resolution: 10 ps.
Roll Mode: Ranges 500 ms to 1,000 s/div.
For > 50k points: 10 s to 1,000 s/div.
External Clock: 20 - 100 MHz on EXT input with ECL, TTL or zero crossing levels.
Optional 50 MHz to 500 MHz rear panel fixed frequency clock input.
External Reference: Optional 10 MHz rear-panel input.

3.5 Triggering System

Modes: Normal, Auto, Single, and Stop.
Sources: CH1, CH2, CH3, CH4 Line, Ext, Ext/10. Slope, Level and Coupling are unique to each source.
Slope: Positive, Negative.
Coupling: AC, DC, HF, LFREJ, HFREJ.
Pre-trigger recording: 0 to 100% of full scale (adjustable in 1% increments).
Post-trigger delay: 0 to 10,000 divisions (adjustable in 0.1 div increments).
Holdoff by time: 10 ns to 20 s.
Holdoff by events: 0 to 99,999,999.
Internal Trigger Range: ±5 div.
EXT Trigger Max Input: 10MΩ//15pF (system capacitance using PP005):
400V(DC+peakAC≤10kHz)
50Ω ±1%: ±5 V DC (500 mW) or 5 V RMS.
EXT Trigger Range: ±0.5 V (±5 V with Ext/10).
Trigger Timing: Trigger Date and Time are listed in the Memory Status Menu.
Trigger Comparator: Optional ECL rear panel output. Alternatively, the calibrator output can provide a trigger output or a PASS/FAIL test output.

3.6 Smart Trigger Types

Pattern: Trigger on the logic combination of 5 inputs - CH1, CH2, CH3, CH4, and EXT Trigger, where each source can be de-fined as High, Low or Don't Care. The Trigger can be defined as the beginning or end of the specified pattern.
Signal or Pattern Width: Trigger on width between two limits selectable from ≤ 2.5ns to 20s. Will typically trigger on glitches 1ns wide.
Signal or Pattern Interval: Trigger on interval between two limits selectable from 10ns to 20s.
Dropout: Trigger if the input signal drops out for longer than a time-out from 25ns to 20s.
State/Edge Qualified: Trigger on any source only if a given state (or transition) has occurred on another source. The delay between these events can be defined as a number of events on the trigger channel or as a time interval.
TV: Allows selection of both line (up to 1500) and field number (up to 8) for PAL, SECAM, NTSC or non-standard video.
Exclusion Trigger: Trigger on intermittent faults by specifying the normal width or period of a signal. The oscilloscope will trigger only on aberrations which are shorter or longer than normal.

3.7 Autosetup

Pressing Autosetup sets timebase, trigger and sensitivity to display a wide range of repetitive signals. (Frequency above 50Hz; Duty Cycle greater than 0.1%).
Autosetup Time: Approximately 2 seconds.
Vertical Find: Automatically sets sensitivity and offset for selected channel.

3.8 Probes

One PP005probe is supplied per channel. DC to 500 MHz typical at probe tip, 500 V max.
Probe calibration: Max 1 V into 1 MΩ, 500 mV into 50 Ω, frequency and amplitude programmable, pulse or square wave selectable, rise and fall time 1 ns typical.

3.9 9" Color Display

LeCroy provides a very large, sharp oscilloscope screen that is 50% larger in total viewing area than a 7" screen.

Its powerful features include Analog Persistence, Color Graded Persistence, Full Screen mode, Opaque or Transparent display, color association and personal color schemes. These provide the user with outstanding benefits that accelerate visual processing and effective communication of on-screen information.

3.10 High Speed Acquisition

The design and debug of fast digital systems and the need to capture fast transient signals require high speed signal capture. The LC574AA four channel 1 GS/s, 1 GHz bandwidth DSO operates at a 4 GS/s sample rate for single channel inputs. The high sample rate, bandwidth and the 1 GHz trigger bandwidth provide a flexible solution for capturing and viewing fast rise time signals.

3.11 Large Sample Rate Window

Having a high sample rate in a DSO is only the first step to preserving data integrity. The time window over which this sample rate is available is also of critical importance.

Long acquisition memory maintains the oscilloscope's highest sample rate for large time windows allowing the user to sample long signals with high horizontal resolution.

With up to 8 million points of acquisition memory the maximum sample rate of these oscilloscopes of 4 GS/s is maintained for a time window of 2ms. This sample rate window - 16 times greater than the maximum sample rate window of competing DSOs - enables the user to record long signals with high resolution.

3.12 Optimum Performance

SMARTMemory is a Total Memory Management system that dynamically allocates resources of microprocessor power, acquisition memory and processing RAM. The intelligent management provided by SMARTMemory guarantees optimal usage of oscilloscope resources.

The 96 MHz PowerPC microprocessor at the heart of these DSOs drives the system to produce results fast, providing rapid waveform update and super panel responsiveness.

3.13 Quick Diagnoses

Capturing and viewing waveforms is fundamental to an oscilloscope. Productivity improvements are accessible by using built-in math functions to assist troubleshooting and diagnoses of circuit problems.

The signal analysis capability of these DSOs is enhanced by advanced waveform math, spectrum analysis, and waveform parameter analysis. This analysis capability greatly increases the speed with which circuit problems are clearly identified and solved.

3.14 Analog Persistence

At a push of the green button the user can switch between an analog view and a digital view of signals on these oscilloscopes.

The depth of signal information can be explored along the third dimension of the waveform display to give the user a complete picture of waveform activity.

Unlike an analog oscilloscope, all signal data is captured and available in memory for analysis and measurements. Analog Persistence gives the user the best of both the analog and digital world of oscilloscopes.

3.15 Full Screen Grid

These LeCroy DSOs not only have a very large 9" screen but also provide a display mode with an extra-large grid, up to 150% larger than common grid areas. In Full Screen mode, all of the screen area is used to display signals. This provides a magnificent view of up to 8 waveforms: signal details are seen more clearly and with greater ease.

3.16 8 Trace display

8 trace display with any combination of math functions, zooms, reference memories or channels.

Octal grid display in normal and Full Screen display modes, with and without parameters displayed.

3.17 Easy Documentation

All waveform data and results of analysis can be quickly saved to floppy disk, memory card, ATA flash card, or a removable hard disk. This provides an efficient way to archive information and facilitates easy documentation of results.

An optional internal graphics printer outputs screen dumps in seconds providing the user with an immediate and clear record of signal activity.

3.18 Signal Viewing

Type: Color 10" Raster Scan CRT, 0.26mm dot pitch.
Resolution: 640 x 480 points.
Display Area: 170mm x 125mm - 50% greater than that of a 7" display.
Controls: Rear-Panel presets for position, brightness and contrast.
Menu controls for brightness and color selection.
Grid Styles: Single, Dual, Octal, Quad, XY, Single+XY, Dual+XY, and Full Screen an enlarged view of each grid style.
Graticules: Internally generated; separate intensity control for grids and waveforms. Selectable blending of grid with displayed traces.
Waveform Style: Dot Join with optional sample point highlight or Dots only.
Persistence Modes: Color graded persistence and analog persistence, infinite or variable with decay over time. In color graded persistence a color spectrum from red through violet is used to map signal intensity. With Analog Persistence the brightness level of a single color denotes signal intensity. Each trace's persistence data is stored in 64k levels.
Trace Display: Opaque or transparent mode, with overlap management.
Number of Traces: 8 (any mix of channels, memories or Math functions).
Real-time Clock: Date, hours, minutes, seconds.
External Monitor: Rear-panel 15-pin socket for VGA compatible monitor.
Vertical Zoom: Up to 5x vertical expansion to a maximum of 5 mV/div (50x with averaging)
Horizontal Zoom: Waveforms can be expanded to give .4-.5 points/division. Zoom factors up to 2,000,000x with all channels combined for the 'AL' model.

3.19 Signal Analysis

A comprehensive and easy-to-use set of diagnostic tools are available. Calculations are performed rapidly and results can be presented on-screen or stored to disk.
Rapid Processing System
Microprocessor: 96 MHz PowerPC™ 603e.
System RAM: 8 to 64 Mbytes.
Video Memory: 1 Mbyte.
Cache Memory: 32 kbyte.
Persistence Data Map Memory: 16 bits per displayed pixel (64k levels).

3.20 Waveform Processing

Up to four processing functions may be performed simultaneously. Standard functions available are: Add, Subtract, Multiply, Divide, Negate, Identity, Summation Averaging and Sine x/x. The source information for a math function trace can be data from an acquisition channel or from another math function trace. This allows display of traces which "daisy chain" math functions.
Average: Up to 10^6 averages are possible.
Extrema*: Roof, Floor, or Envelope values from 1 to 10^6 sweeps.
ERES*: Six Low-Pass digital filters provide up to 11-bit vertical resolution. Sampled data is always available, even when a trace is turned off.
FFT*: Spectrum Analysis with five windowing functions and FFT averaging.

3.21 Statistical Diagnostics*

The Parameter Analysis package permits in-depth diagnostics on waveform parameters. Live histogramming of any waveform parameter measurement is possible and the histogram can be autoscaled to display the center and width of the distribution.
Any of the above processes can be invoked without losing the data.

*Extrema and ERES modes are provided in the Advanced Waveform Math Package. FFT is in Spectrum Analysis. Histogramming and trending is part of the Parameter Analysis Package.

3.22 Internal Memory

Waveform Memory: Up to four 16-bit Memories (M1, M2, M3, M4), whose length corresponds to the length of the channel acquisition memory.
Zoom & Math Memory: Up to four 16-bit Waveform Processing Memories (A, B, C, D), whose length corresponds to the length of the channel acquisition memory.
Setup Memory: Four non-volatile memories. Optional Memory Cards, Flash Disks or removable Hard Disks may also be used for high-capacity waveform and setup storage.

3.23 Cursor Measurements

Relative Time: Two cursors provide time measurements with resolution of ±0.05% full scale for unexpanded traces; up to 10% of the sampling interval for expanded traces. The corresponding frequency value is displayed.
Relative Voltage: Two horizontal bars measure voltage differences up to ±0.2%, of full scale in single-grid mode.
Absolute Time: A cross-hair marker measures time relative to the trigger and voltage with respect to ground.
Absolute Voltage: A reference bar measures voltage with respect to ground.

Automated Measurements

A wide range of pulse parameter measurements are available. These are categorized for ease of use. The categories include Pulse, Horizontal, and Vertical parameters. Basic statistical measurements, included as standard, (average, highest, lowest, and standard deviation) can be made on these parameter measurements in order to understand their distribution. Pass/Fail Testing and Waveform Limit testing using masks can be performed. Test conditions can be expressed as either waveform parameter limits, waveform shape limits (mask) or a combination of both. Any failure can cause preprogrammed actions such as Hardcopy, Save, GPIB service request, logic pulse out, audible beep, or any combination of the above.

3.24 Additional Information

Interfacing

Remote Control: Possible by GPIB and RS-232-C for all front-panel controls, as well as all internal functions.
RS-232-C Port: Asynchronous up to19.2 Kb/s for computer/terminal control or printer/plotter connection.
GPIB Port: (IEEE-488.1) Configurable as talker/listener for computer control and fast data transfer, up to 300 kbytes/sec. Command Language complies with requirements of IEEE-488.2.
Centronics Port: Hardcopy parallel interface is standard.
PC Card (PCMCIA I/II/III) Ports: For memory cards, ATA compatible flash cards and removable hard disks - optional.
Floppy Disk: High density 3.5" floppy disk drive (DOS format) is standard.
VGA Compatible Display: 15-pin D-type VGA compatible connector for external color display.
Hardcopy: Screen dumps are activated by a front-panel button or via remote control. TIFF and BMP formats are available for importing to Desktop Pub-lishing programs. The following printers can be used to make hardcopies:
B/W: HP LaserJet, HP DeskJet 500, Epson FX.
Color: HP DeskJet 550C, Epson Stylus. An optional internal high resolution graphics printer is also available for screen dumps; a stripchart output format with 2 meters per division is also possible.
Output Formats: ASCII waveform out-put is available in seconds, compatible with spreadsheets, MATLAB™, MathCad™. Binary output is also available.

General

Auto-calibration ensures specified DC and timing accuracy.
Temperature: 5° to 40°C (41° to 104° F) rated 0° to 50°C (32° to 122° F) operating.
Humidity: 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.
Altitude: Up to 2000m (operating), 40°C max.
Power: 90-132V AC, 180-250V AC, 45-66 Hz, 400 W.
Battery Backup: Front-panel settings maintained for two years.
Dimensions: (HWD)10.4" x 15.65" x 17.85", 264 mm x 397 mm x 453 mm.
Weight: 20kg (44 lbs) net, 28 kg (61.6 lbs) shipping.
Warranty: Three years.
UL: Meets UL safety standards.

CE Approval

EMC: Conforms to EN50081-1,EN50082.
Safety: The oscilloscope has been designed to comply with EN61010-1 Installation Category (Over-voltage Category) II, 300V, Pollution Degree 2.

4. Theory of Operation

4.1 Processor Board : F9601-1-8 or F9601-1-64

MPC603e Processor

This processor board is based on to the Power MPC603e processor.
It is a 64-bit RISC processor with 2x32kbyte cache. It features high speed processing and fast memory accesses.
The processor is set to an internal clock of three times the external bus clock (3x32MHz = 96 MHz), and used in a 32-bit mode.

There are two "worlds" on the board:

- the 32-bit world, including the main PowerPC processor, the dynamic RAM modules and the VGA interface;
- the 8 or 16-bit world, including all other on-board peripherals, external small peripherals and acquisition board.

A MC68150 dynamic bus sizer is used as an interface between the two worlds.

Power Supplies

The board uses three power supplies from the main acquisition board: Vcc, +15V and -15V. Vee is wired on a connector for board test purposes.
The +15V supply OP-amps on the 9601-1 board, and +15V and -15V supply small peripherals.
The current processor needs a 3.3V power supply, all the rest of the logic needs 5V. All signals are TTL compatible.
The PLL circuit (88916) generates a PLL_LOCK signal, which is used to clamp the 3.3V and 2.5V references as long as the 32MHz clock is not stable. The processor also needs to be protected against too big voltage differences between 2.5V and 3.3V (diodes on the reference).
An OP-amp and a MOSFET transistor for each power supply are used. The reference voltages are taken directly from the 5V power supply by a resistive divider.
Capacitors and a few diodes ensure that the supplies do not exceed dangerous levels at power-up, nor rise too fast.

32-bit Peripherals

There are only three devices hooked up on to the processors 32-bit data bus:

- the VGA video controller
- the DRAM system
- the bus sizer, bridge to the 68k-like world

Processor Block Diagram

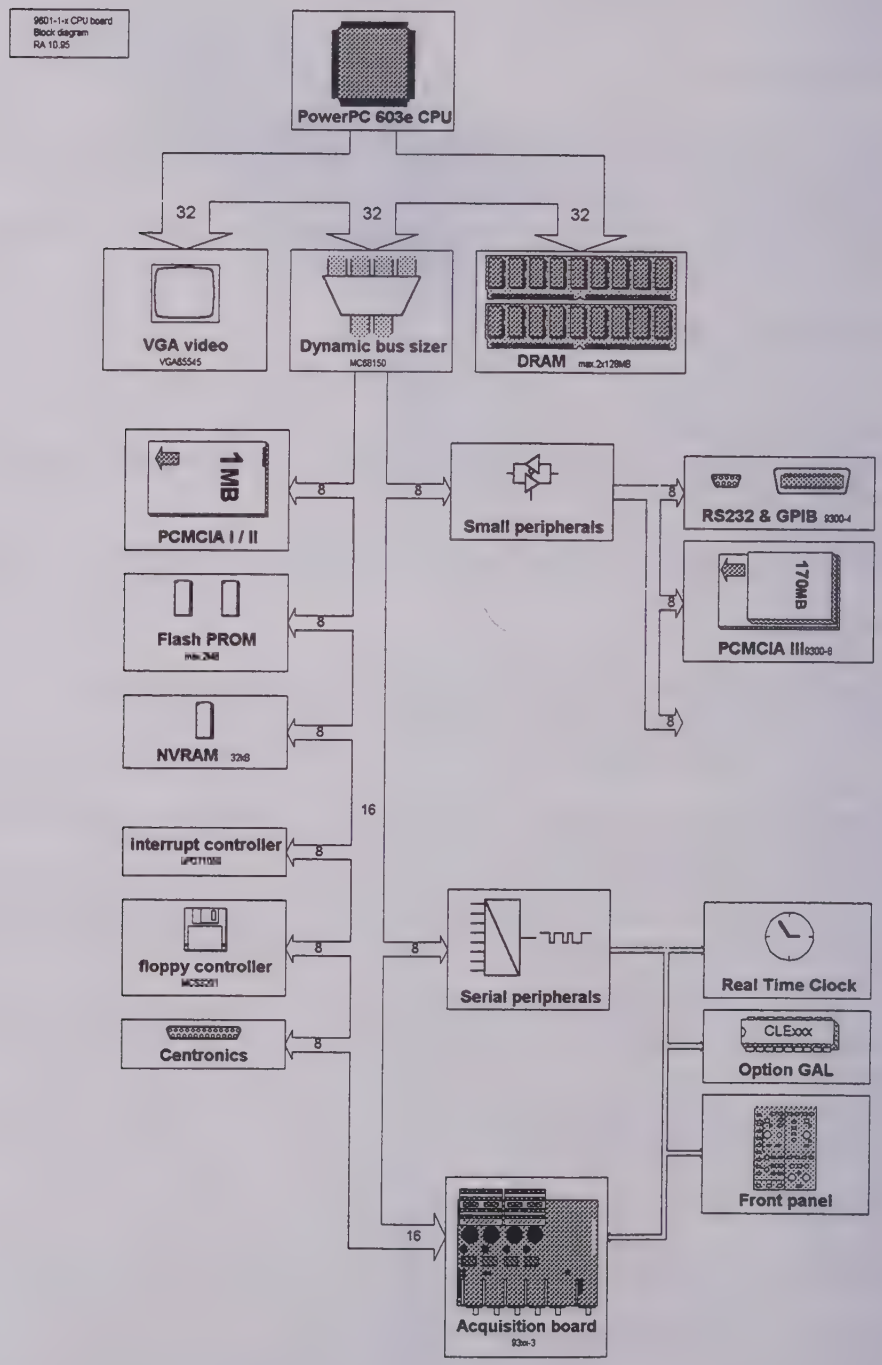


Fig 4-1 9601-1 Block diagram

DRAM

The DRAM consists of two SIMM modules from 4 MB up to 32 MB each.
By interleaving two SIMMs, the access time is dramatically reduced (one beat every 30ns, while the other module "recovers" from the previous access).
The DRAM control logic, including refresh control, is built around several GALs and a few gates.
RAMEUR (A44) is the main sequencer. It inserts refresh cycles whenever needed, and drives row and column addressing timing.
RASADE (A39) controls the row address select lines of the memory modules, and generates the addresses for double beat or burst accesses.
OCCASE (A37) generates the column address select lines of the SIMMs.
DRAME (A57) holds some glue logic, and a state machine that counts the number of beats, inserting pauses in the access if necessary (single SIMM support).
Four multiplexers (A40, 42, 46 and 47) switch between odd and even addresses to be sent to the address lines of the modules. One more multiplexer (A38) switches low order address bits, routing them either directly to the processor, or to the DRAM address generator in RASADE.

Normal Access Timing

This is the simplest access possible: the processor puts an address onto the address bus, and reads back or writes one long word (32-bit wide) to DRAM. Depending on the address (odd or even), bank A or bank B is selected in a dual SIMM configuration.

Burst Access Timing

A burst access on a 603e configured as a 32-bit device, consists of either two ("double beat") or eight ("burst") successive reads in DRAM. The idea is to put a start address onto the address bus, and read back or write several data's from or to DRAM every clock cycle, without the processor incrementing the address (this is done by the external logic). To increase system performance, the memory has been interleaved, allowing each module to access a memory location every 60ns, but with a delay of 30ns between the modules.
A burst access is signaled by an active low _TBST signal and a 32-bit access (SIZ2..0= 011), a double-beat access is indicated by a high _TBST but an access size of 64 bits (SIZ2..0= 100). The double-beat case is decoded by a GAL (VIADUC), and the signal is named _DBEAT (active low).

Refresh Timing

The 32 kHz clock from the real time clock chip is used to refresh periodically the DRAM.
The GAL RAMEUR generates the refresh cycles, as well as the sequencing of _RAS and _CAS. Depending on the operating mode, it chooses to access slot A or selects alternately slots A and B.

Memory Mapping

By default, the board is set to the biggest memory size possible. The software checks out for "holes" in the addressing space, and sets accordingly two configuration lines, MAP1 and MAP0.

MAP1..0	meaning
00	2x4, single sided SIMMs
01	2x8 MB SIMMs
10	2x32 MB SIMMs

VGA

The VGA 65545 controller chip (A27) includes its own address decoding logic. It generates all video signals (red, green and blue video, horizontal and vertical syncs, and all control lines to drive a flat panel) and controls its associated 1 MB video dynamic RAM (reads, write and refresh cycles).
All timings are extracted from the 16 MHz bus clock, so no external crystal or timebase is needed.

The horizontal and vertical sync. signals are sent to both the internal and the external video connector (high density DB15 on the 9601-2 board). The external syncs are direct, the internal syncs pass through the GAL VIADUC (A32), allowing to force these two lines to ground. This puts the internal display in power down mode (standby mode).
The chip can support several bus interfaces (PCI, ISA, VL,), it is configured as VL-bus.

The 65545 chip generates red, green and blue video signals. These are controlled-impedance lines (37.5 Ohm approximately, which corresponds to two 75 Ohm loads in parallel). A low-pass filter is implemented right at the outputs from the VGA controller, and another low-pass filter is located at each video connector on the 9601-2 board (just after the "active" load).

9601-2 Board: VGA proper termination (auto termination)

The 9601-2 board is a complement to the 9601-1 main processor board. It holds the external Centronics connector (female DB-25) with its EMI filters, both internal and external VGA connectors (female mini DB-15), and line termination for R, G and B signals.

The VGA controller is able to drive a load of 37.5 Ohms on its Red, Green and Blue outputs (two 75 Ohms loads in parallel). The line impedance of these signals on the processor board is therefore close to 37.5 Ohms. The 9601-2 board includes a special termination circuit that keeps the loads on the R, G and B lines at 37.5 Ohms, no matter if one or two 75 Ohms loads are connected. The circuit assumes that a 75 Ohms load is present on each output.

Bus Sizer

The MPC603e processor does not support dynamic bus sizing, as did the 68k family. Many parts of the software and the hardware rely on that feature. A Motorola MC68150 chip 'translates' the PowerPC 32-bit data bus to a 68030 8 or 16-bit bus. Except DRAM and VGA controller, all peripherals work on this 68k-type bus. Full compatibility is therefore ensured with current acquisition boards and small peripherals.

16 and 8-bit Peripherals

The only 16-bit peripheral hooked on the bus is the acquisition board.
RETINE (A36) generates wait state timings and is used to switch between cold boot (return to default state) and warm boot (do a RESET, but keep current scope settings), and generates a bus error if max. access time is out and no peripheral has acknowledged the access.
ASSISE (A21) generates chip select signals for the bus sizer, BUDGET (A28) creates typical 68k signals (_BAS, _BDS, 16MHz clock).
The peripheral address decoding is done by a set of GALs (GRANDS (A20), PETITS (A29)) and a few multiplexers (A30, A22). GRANDS selects between main peripheral categories (VGA, DRAM, memory card, flash PROM, acquisition board or other peripherals), PETITS generates chip select signals for 8-bit peripherals (flash PROM, memory card, non-volatile RAM, Centronics and "others"). It also determines how many wait states are needed for peripherals not able to acknowledge a bus access. This is done by pulling low _DSACK0 after having sensed the corresponding number of wait states trough _BWT1 and _BWT3, which ends the current access.
The multiplexer A30 does a finer decoding between "others" decoded in PETITS, namely interrupt controller, small peripherals, serial interface, flash PROM chip 1 or 2, and status registers.

PCMCIA type I / II interface

This interface consists mainly of buffers for both data and address busses.
An OP amp (A10) and a MOS transistor (Q3) allow to switch off the memory card power supply while no card is plugged in, and turn it on slowly when plugged in.
The GAL CARDAN (A11) handles the card format and generates several control signals accordingly.
A16 (an hex D-type flip-flop) holds control bits for 12Vpp (flash programming voltage), DRAM memory mapping and memory card type. All bits of this register reset to zero when the _RESET signal goes active low, which means that their state is also guaranteed at power-up.
A9 and A12 are the read registers for several status bits.
Several EXOR gates (A17 and A18) invert the most significant address bits of the memory card whenever the SWAP jumper is plugged in, so that the first bytes are always located at 0xFFF00000, regardless of the size of the memory card. This allows to boot directly from a PCMCIA memory card.

Flash PROM

Two Intel 28F008-compatible 1MB PROMs (A24 and A25), are used.
From a hardware point of view, a flash PROM is the same as an EPROM in read mode. To write to it, however, a programming voltage (Vpp) needs to be applied to a pin. The 12V voltage is generated by a switching regulator (A26), controlled by a logic level (_EPPP).

NVRAM

This chip is powered through the lithium battery (VCT) when power is off. The chip select is held high through a pull-up resistor to VCT to avoid accidental overwriting while power is off.

Interrupt Controller

In order to keep compatibility with both 68k hardware and software, it is necessary to use a chip that prioritizes several interrupt sources. This is done by an NEC chip, a uPD71059. It scans eight interrupt pins and sends a unique interrupt to the processor when a (non-masked) interrupt appears.

Interrupt levels are assigned the following:

level 0	(lowest priority) acquisition board
level 1	small peripherals, unused
level 2	RS232
level 3	GPIB
level 4	small peripherals and acquisition board, unused
level 5	real time clock
level 6	time base (acquisition board)
level 7	(highest priority) only for test purposes. Linked to level 2 for debugging.

Floppy Controller

The floppy controller chip directly interfaces to a double or high-density disk drive. The floppy controller has a digital 8-bit input/output register, which is used to read several status lines from the drive (disk inserted, etc.).
In principle, the controller is able to provide an interrupt when accesses are completed. As these accesses are performed in non-time critical paths of the program, The interrupt line has been wired to the input register, so that the program has to poll this register until the interrupt line goes active.
The controller has it's own timebase, a 24MHz crystal.

Centronics

Both external and internal Centronics ports are write-only. The data get latched in a 74HCT374 register (A45 for internal Centronics, A55 for external).

Small Peripheral Interface

This 8-bit interface is intended to allow external expansion to the processor board. A56 and A53 (74HCT541 tri-state buffers) buffer the address and control lines, and A62 (74HCT245, bi-directional tri-state buffers) buffer the data lines.
The address decoding is done on each peripheral board. The acknowledge for each access is also done by the peripheral device, so that there is no restriction on wait-states. The bus clock runs at 16mhz, and a reset line reinitializes the boards at the same time as the CPU.
Four interrupt lines are also included in this interface, so that interrupt-driven boards can be used (a good example is the 9300-4 GPIB/RS232 board, which uses interrupts 2 and 3).

Serial Interface for on-board Peripherals

Two GALs (SEVERE and SAVEUR) are used to access serial on-board devices, like the real time clock, option GAL, front panel and some parts of the acquisition board. The principle of such a serial access is the following:
every write or read to the serial interface allows to write or read one bit (the MSB of the byte). To write a byte to a serial device, you need eight accesses to the serial interface.
Many serial devices need the same protocol: you first send a command byte (read, write, clear, etc.), and then read or write one or several data (if required).
Depending on the address the serial interface is been accessed, the corresponding device gets selected (_SSER, _SFPR, _SLED or SRTC lines). A clock (_SCKA), a read data (SDRA or SDRD) and a write data (SDWA or SDWD) constitute the serial interface itself (the D suffix on read and write data lines means Digital, i.e. devices on the CPU board; an A suffix means devices on the Acquisition board).

RTC

The 68HC68T1 real time clock has several functions:

- keep a time-of-the-day and current-date information while the DSO is not powered on.
- generate a 32kHz clock for DRAM refreshment.
- generate a 128Hz periodic interrupt to force bus accesses from the processor (otherwise the watchdog timer would time out and reset the board) and allow periodic update of the time display ("scope alive").

The chip uses it's own 32.768kHz crystal to keep the time and derive all timings. A few discrete components around it leave the chip powered by the backup lithium battery while the rest of the board is not powered, and charge the battery when the power is on again.

Option GAL

The option GAL is a hardware key to unlock specific software functionality's. A pattern is sent to the GAL, which responds with another pattern. If the two fit, the feature is unlocked.

Front Panel

The front panel LED can be controlled by a serial write access. The LED (write only) shares the same address as the option GAL (read only).
The LED is driven by the less significant bit (LSB) of the control register.

Watchdog and Reset Generation

The power supply is monitored by a TL7770-5 chip. Whenever the Vcc voltage goes below 4.8V (even for a short time !), a reset pulse is generated, whose width is determined by an RC time constant (33uF and internal resistor).
The second half of this chip serves as watchdog circuit. The processor needs to poll a sense line on that chip from time to time (typically a few ms). By doing this, a capacitor (33uF) is discharged. When not polled, it gets charged by a constant current, and when a given threshold is exceeded, a reset pulse is generated.
The LED connected goes off whenever the _RESET line is low, so a blinking LED indicates either no bus access for longer than a few hundreds of ms, or a problem (glitch) on the Vcc power supply.

Bus Error Generation

A bus error exception is generated when the _TEA pin is pulled low on the processor. The 603e expects a _TA signal as an acknowledge to the current data transaction, and inserts wait states as long as _TA has not been pulled low at the correct timing (refer to the MPC603e documentation for exact timing information's). An external circuit is required to break the pending cycle if no device responds after a given time-out.
This is the job of the GAL RETINE (A36), which counts the number of wait states already passed (4 bit Gray counter). An external 4-bit counter (A59) extends the count to 160 (tbd) wait cycles before triggering a bus error.
An acknowledge (_DSACK1..0 lines) aborts the time-out count and finishes successfully the current cycle.

I/O Structure and GALs Involved

The following bloc diagram describes the peripheral decoding flow, and what GAL is involved in the decoding. The three frames group the peripherals into 8, 16 or 32-bit devices. The simple 3D-blocs represent an on-board device. The 3D-blocks with an arrow represent external devices (more generally: accessed through a connector).
GRANDS does the main decoding of peripherals and the 93xx-3 acquisition board.
PETITS does the sub-decoding for all 8-bit peripherals.
VIADUC handles the Motorola to Intel format decoding for the VGA controller.
CARDAN takes care of the PCMCIA interface timings.
PROFIL dispatches 8-bit data to the Centronics or the Floppy controller.
SAVEUR and SEVERE generate the serial clock and routes the data to the right serial device, including CLExxx, which is the option PAL.

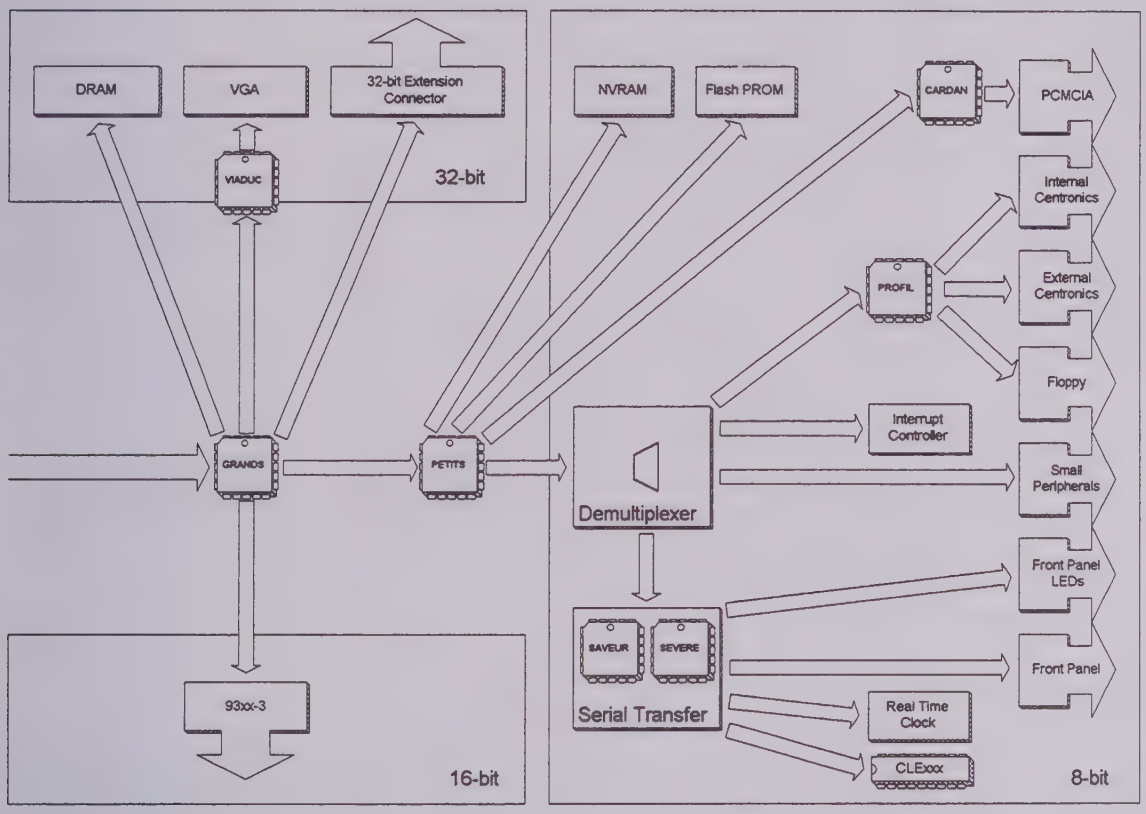


Fig 4-2 Peripheral Decoding and Data Bus Size

Not shown in Fig.4-2, are a few GALs for miscellaneous functions (like DRAM refreshing).
RASADE generates the RAS signals and the lower addresses for DRAM. It also supports the signals needed for interleaved burst mode.
OCCASE generates the CAS signals for DRAM.
RAMEUR is the main sequencer for the DRAM , and handles the access precharge and the refresh system.
BUDGET translates a 680x0 bus cycle into a PPC cycle, and handles fast cycles, like accesses to DRAM or VGA.
RETINE counts the wait states and generates a bus error if no response after too many (153) wait states. It also generates the system reset.
ASSISE decodes CPU space cycles and controls the bus sizer.

4.2 F9384-31 (900022) Main Board

4.2.1 Introduction

The board is divided into five sections :

- Microprocessor control.
- Front-end
- Trigger
- Analog to Digital Converter and memory
- Time base

4.2.2 Microprocessor Control

The microprocessor interface provides the address, data, and control interface for the microprocessor card plugged into connector J1. This is the only interface to the data acquired by the acquisition card. This interface is essentially identical to the 9354 and 9374 interface. The main power supplies provided on connector J2 are +/-15 volts, +/-6 volts, +/-5 volts, and +3.3 volts.

4.2.2.1 Data Bus Buffer

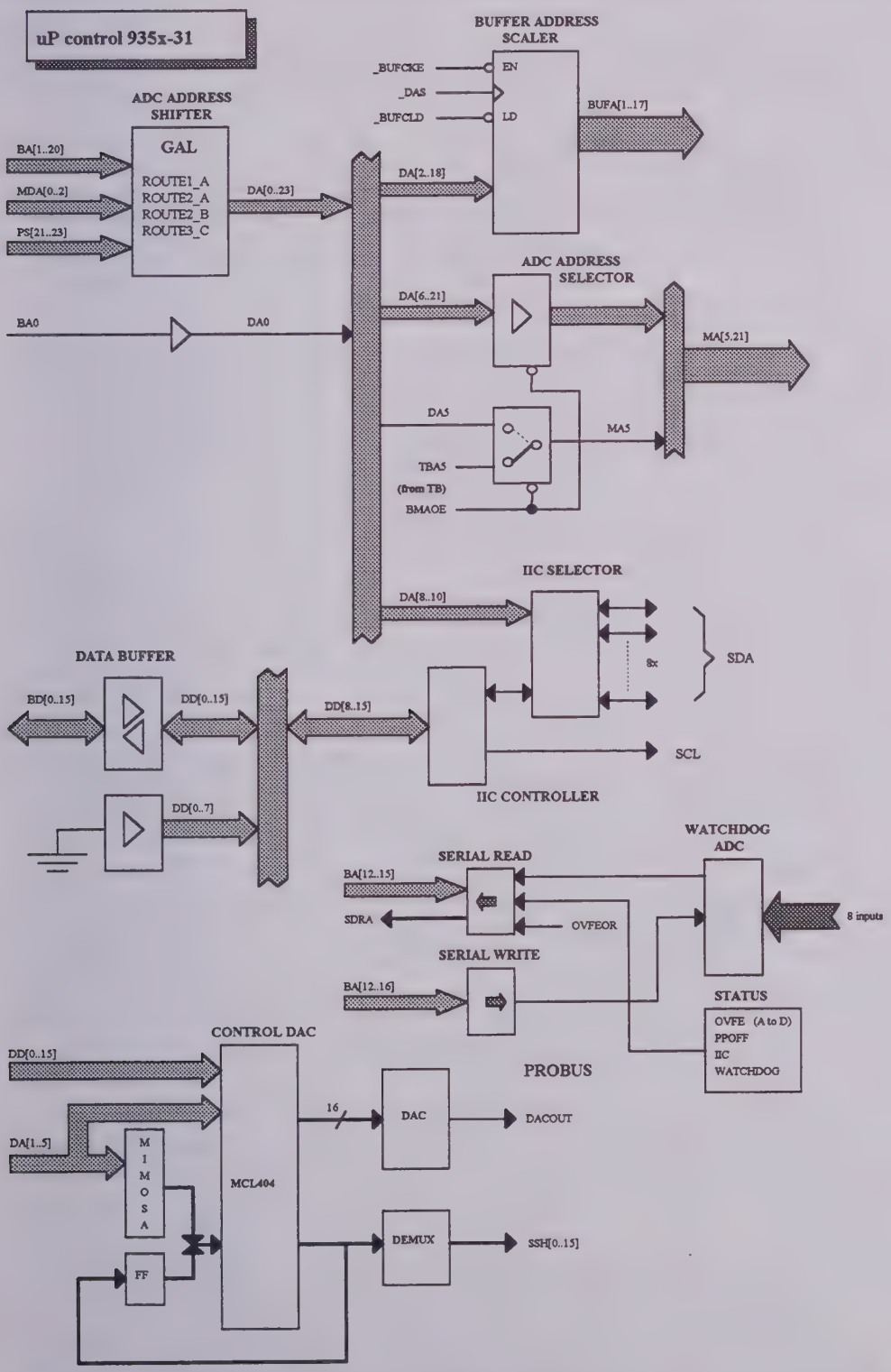
The data bus BD(0:15) from the microprocessor is buffered by A12 and A14 to unload the microprocessor bus from the extended bus DD(0:15) on the acquisition card. There is a one to one mapping of the two busses. All data flows through this bi-directional bus buffer. An additional eight bit buffer (A27) provides zero fill for the least significant eight bits of the bus when the processor reads data from the acquisition or buffer memory.

Bus	Bus name	Description
BD(0:15)	Data bus	Microprocessor data bus, bi-directional
DD(0:15)	Internal data bus	Internal buffered microprocessor data bus, bi-directional

4.2.2.2 ADC Address Shifter

Four GAL16V8's, ROUTE1-A, ROUTE2-A, ROUTE2-B, and ROUTE3-C shift and buffer the address bus BA(0:31) from the microprocessor. The shifted address bus DA(0:31) is used to read the data from the acquisition memory and the buffer memory.

Data from the four acquisition channels are not written into the acquisition memory in a linear sequential fashion. For example, when interleaving channel 1 and channel 2 for a sample rate of 2 Gs/S, channel 1 acquisition memory has the first sample point and channel 2 has the second sample point, these must be read in the correct time sequence to the microprocessor. The address bus shifter is programmed to read the first sample point from channel 1 and the second from channel 2, etc. Similarly, when 4 Gs/S is selected, one sample from each channel is read in the correct time sequence for the microprocessor



Each channel also interleaves two ADC's to sample at 1 Gs/S. At this sample rate two demultiplexers write sample points to memory in a non time ordered sequence. The

address shifter must shift the microprocessor address bus to read the sample points in the correct time sequence.

Bus	Bus name	Description
BA(0:31)	Address bus	Address bus from the microprocessor
DA(0:31)	Shifted address bus	Acquisition memory bus and when selected, the buffer memory address bus

4.2.2.3 Buffer Address Scalar

Acquisition memory is off-loaded to the buffer memory via the MDX622 demultiplexers for direct access by the microprocessor. The buffer memory is sequentially addressed via the address bus BUFA(1:17) by the buffer address scalar, a seventeen bit counter. The buffer address scalar can be loaded with an address pointing to the start of data, then sequential address strobes from the microprocessor increments the scalar, sequentially addressing the buffer memory and writing waveform data. Meanwhile the address shifter reads the waveform data from the acquisition memory in the correct time sequence.

Bus	Bus name	Description
BUFA(1:17)	Buffer address bus	Address bus for the buffer memory which stores a portion of the acquisition memory data.

4.2.2.4 ADC Address Selector

After the acquisition memory is filled by the waveform data, the buffer address scalar is loaded with the starting address for the buffer memory and the shifted address bus is connected to the acquisition memory address bus MA(5:22) with the ADC address selector. (NOTE: During acquisition, the monolithic timebase, MTB411, provides the memory addresses.) Sequential addresses from the microprocessor address the acquisition memory and increment the buffer address scalar, moving the waveform data from the acquisition memory to the microprocessor card. The buffer memory snoops the data and saves the waveform data from the acquisition memory in the local buffer memory. Subsequent accesses to the waveform data by the microprocessor can come from the buffer memory instead of the acquisition memory. The buffer memory stores only 128k samples, one eigth of the samples stored in the acquisition memory. At memory sizes above this value, double buffering in the buffer memory is of little use.

Notice that the buffered sample points are in the correct time sequence for single channel operation. However, when two or four channels are interleaved, the address shifter must be used to read the data from the buffer memory in the correct time sequence for the microprocessor.

Bus	Bus name	Description
MA(5:22)	Memory address	High speed acquisition memory address bus

4.2.2.5 Decode Logic

A programmable device, GAL16V8, called AVENUE-A decodes the upper address bits of the microprocessor address bus to generate the signals shown below.

AVENUE-A	
SPER0, SPER1	select peripheral group
PS21, PS22, PS23	pseudo address output for the address shifter
_EBA	select card
_SMDX	select MDX

Two more GAL16V8's (CHEMIN-A and ARTERE-A) use the output of AVENUE-A, part of the shifted address bus (DA(0:31)), and the microprocessor signals _BAS and _BR_W to write and read the acquisition memory and buffer memory.

The decoded signals of these two decoders are:

CHEMIN-A	
_BUFCLD, _BUFCKE	buffer scalar command output
_WEBUFH, _WEBUFL, _BUWALL	buffer memory command output
_EADR_AB, _EADR_CD, DIOE	ADC command
ARTERE-A	
_EZERO, EADCW	driver command
_SADCM, _ADCOE1, _ADCOE2	ADC memory command output
_WE_AB, _WE_CD	ADC write output
_REBUF	buffer READ output

Another GAL16V8 (MIMOSA-A) is the state machine for the scanning DAC.

The following table is the memory map for the F9384-31 card.

ADC memories (0200 0000 - 0200 FFFF) 16MB			
0200 0000	**021F FFFF**	ADC memory ch. A 1MP	2MB
	023F FFFF	ADC memory ch. A 2MP	4MB
0220 0000	**0227 FFFF**	BUF memory ch. A 256kP	512kB
0240 0000	**025F FFFF**	ADC memory ch. B 1MP	2MB
	027F FFFF	ADC memory ch. B 2MP	4MB
0260 0000	**0267 FFFF**	BUF memory ch. B 256kP	512kB
0280 0000	**029F FFFF**	ADC memory ch. C 1MP	2MB
	02BF FFFF	ADC memory ch. C 2MP	4MB
02A0 0000	**02A7 FFFF**	BUF memory ch. C 256kP	512kB

02C0 0000	02DF FFFF	ADC memory ch. D 1MP	2MB
	02FF FFFF	ADC memory ch. D 2MP	4MB
02E0 0000	02E7 FFFF	BUF memory ch. D 256kP	512kB
Small peripherals (0300 0000 - 033F FFFF) 4MB			
0300 0000	0300 0062	MCL404 Multiplexed DAC	2*36B
0308 0000	0308 0N02	Smart probe IIC controller	xB
0310 0000	0310 000E	MDX416 Data demux ch. A	4B
0314 0000	0314 000E	MDX416 Data demux ch. B	4B
0318 0000	0318 000E	MDX416 Data demux ch. C	4B
031C 0000	031C 000E	MDX416 Data demux ch. D	4B
	031F FFFF	spare	
0320 0000	0320 0005	MST412 Smart trigger	6B
0320 0006	0320 0007	Mode control / status	2B
	032F FFFF	spare	
0330 0000	0330 003F	MTB411 Timebase	64B
Extended buffer memories (0300 0000 - 033F FFFF) 4MB			
0340 0000	0347 FFFF	BUF memory ch. A 2x128kB	512kB
0350 0000	0357 FFFF	BUF memory ch. B 2x128kB	512kB
0360 0000	0367 FFFF	BUF memory ch. C 2x128kB	512kB
0370 0000	0377 FFFF	BUF memory ch. D 2x128kB	512kB
Spare (0380 0000 - 03FF FFFF) 8MB			
0380 0000	03FF FFFF	spare	12MB

4.2.2.6 Serial, Watchdog ADC, Overload, and IIC Control

The microprocessor card provides the serial clock SCKA, write data SDWA, and strobe STRA for the serial data stream that programs most of the DAC's and registers. It reads back the serial data via SDRA. Two decoders (A4 and A10) provide 13 write strobes, generated by STRA. The data is shifted in from the microprocessor to all of the serial DAC's and registers but only the intended DAC's or registers are strobed by the write strobe.

The LC574A has controls for the gain of each flash and delay and offset of each S/H for each channel, a total of six DAC's per channel. These DACs are provided by three octal 8-bit DACs.

The watchdog ADC monitors probe attenuation, calibration voltage, and VCCADC and generates an interrupt when any monitored voltage is outside of the valid range. Attaching a probe to the input of the scope changes the monitored voltage and alerts the microprocessor that a new probe is connected. The probe is interrogated by the microprocessor to determine the type of probe.

An overload condition at any of the 50 ohm inputs generates an interrupt to the microprocessor. The microprocessor reads the status register to determine which of the 8 possible overload conditions caused the interrupt.

The probus connectors are controlled by the IIC controller and IIC selector. IIC is a two wire serial bus used to control the probus probes. The controller controls the four input channels, external trigger input, probe cal, an EEPROM, and another input.

4.2.2.7 Scanning DAC

The scanning DAC is an 18 channel 16 bit DAC for use where precision and resolution are needed in the analog circuits. The DAC output range is +/-10 volts. It has its own reference and is not trimmed for gain or offset.

The MCL404 is a controller chip for the scanning DAC subsystem. Eighteen sample and hold circuits can be updated periodically with the MCL404. The MCL404 sequentially enables each of the sample and hold circuits. A precision 16 bit DAC provides the input to the sample and hold circuits through an analog multiplexer also controlled by the MCL404. The MCL404 has eighteen internal 16 bit registers for the eighteen sample and hold circuits.

Each frontend channel has a gain, offset, and trigger level sample and hold. External trigger level is connected to one sample and hold. Probe calibrate also uses one of the sample and hold outputs.

The scanning DAC is not used to calibrate the S/H and flash gain, offset, and delay. These are independent DAC's near each acquisition hybrid.

4.2.2.8 Power Supply Connector

The power supply provides +/-15 volts, +/-6 volts, +/-5 volts, +3.3 volts, -2 volts and line. All voltages except for line appear at connector J2. Line appears on connector J4. Line is a TTL compatible square wave synchronized to the ac power supplying the instrument.

4.2.3 Front End

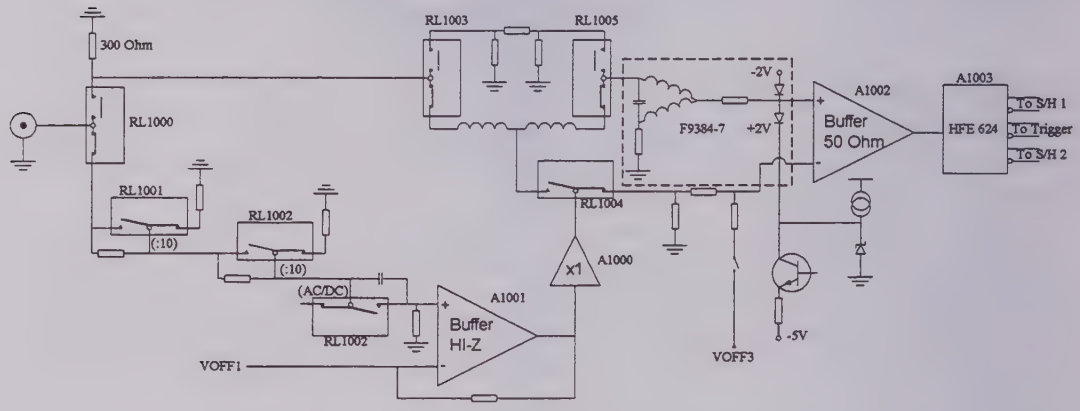
The front end system provides the signal conditioning for the ADC system.
The main functions are :

- four channel operation, calibration with software control
- input protection and coupling : AC, DC, 1 MΩ, 50 Ω
- amplitude normalisation for the ADC system : 320 mV full scale
- fine gain control
- offset control
- bandwidth limit filter : BWL 25 MHz or 200 MHz user selctable
- triggering with standard coupling and TV trigger on four channels and External

Six power supplies are generated from +/-15 volts and +/-6 volts for use in the frontend. These are: +/-12VFEP, +/-12VFE, and +/-5VFE. A reference supply VREF at 5 volts is generated by an SMLM336-5 from +12VFE.

4.2.3.1 Channel Description

The four channels are identical, thus only one channel will be described for brevity.



Attenuation/Coupling Stage

- Relay RL1000 selects the input between the **HiZ** (1 MΩ) and the 50 Ω path. A diode circuit senses the temperature of the 300 Ω termination and sets the _OVL bit low if overheating is detected. If overload is detected the 50 Ω path is then disconnected by the hardware and the 1 Mohm input is switched in.
- Relay RL1001 selects the input between divide-by-10 or direct for the signal in the **HiZ** path.
- Relay RL1002 selects another divide-by-10 or direct for the signal in the **HiZ** path
- Relay RL1003 selects the input between another divide-by-10 or direct for the signal in the 50 Ω path.
- Relay RL1004 enables the **HiZ output** (selection between 1MΩ output & offset for 50 Ω buffer).
- Relay RL1006 sets the AC/DC coupling in HiZ.
- Relay RL1007 selects the ouput between no attenuation in 50 Ω or HiZ (if RL5 is ON) to attenuate by 10 in 50 Ω.
- Switch SW1 (_Voff3) enable :This signal is only used for the calibration of the 50 Ω path when 1 MΩ coupling.

HFE624:

The HFE624 provides the following functions:

- Fine gain control to fill up the fixed vertical sensitivities with a 13:1 gain control range
- Bandwidth limit filter at 25 MHz and 200 MHz
- Three outputs, one for the trigger circuit and two for sample and hold input.
- Amplitude normalisation for the ADC system : at the BNC the dynamic range is 16 mV to 8V FS at 50 Ω and to 80V FS (full scale) at 1 MOhm in a 1-2-5 step sequence and the ADC system input is 500 mV differential,

4.2.3.2 Digital controls

The following controls are for the front end in the 9354. Note: Bits 16-23 are internal to the HFE624 and are written as a serial data stream.

0141 0z00 - 0141 0zff write channel A control register
0141 1z00 - 0141 1zff write channel B control register
0141 2z00 - 0141 2zff write channel C control register
0141 3z00 - 0141 3zff write channel D control register

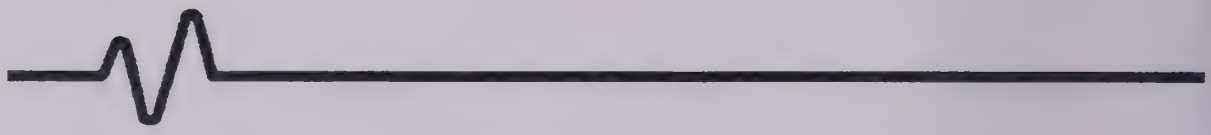
23							16
—	ENc	ENb	ENa	G1	G0	BWL1	BWL0
15							8
RELSHA	:1 50	:10 50	:100 1M	:10 1M	AC/DC	1M	50
7							0
—	—	—	—	—	—	OF_BUF50	—

ENc : Enable MFE output C
ENb : Enable MFE output B
ENa : Enable MFE output A
G1,G0 : Gain range; 0 = range*1, 1 = range*2, 3 = range*5
BWL1,BWL0 : Bandwidth limit; 0 = off, 1 = 200 MHz, 2 = 20 MHz
RELSHA : 0 = direct, 1 = (A:BA, D:CD)
:1 50 : RL7; 1 = x0.1 and 1M calibration, 2 = x1
:10 50 : RL6; 1 = 50 Ohm calibration and 1mohm running
:100 1M : RL3; 1
:10 1M : RL2;
AC/DC : RL4; 0 = AC, 1 = DC
1M : RL5;
50 : RL1
OF_BUF50 : 0 = user mode, 1 = 1mohm calibration mode

0140 4z00 - 0140 4zff read channels overload (and option package availability)

7							0	LSB-1
_INTWD	_INTIIC	_OVL_T	_PPOFF	_OVL_D	_OVL_C	_OVL_B	_OVL_A	OPT

_INTWD watchdog ADC interrupt,
_INTIICI2C protocol interrupt,
_PPOFF probe power overload interrupt,
_OVL_noverload indicator (Ch A, B, C, D, EXT).



OPT935XA-CKTRIG option package (9th bit of serial read).

A low state indicate that overload or interrupt is detected. Bit OPT is high when the options are available.

0140 5z00 - 0140 5zff read overload sum

OVLSUMbit 7, Sum of the eight above bits.
0 = OK, 1 = problem occurred (read channels overload)

4.2.3.3 Analog controls

- One precision DAC, with its associated control system, drives and refreshes a multiple sample-and-hold system. Each channel has three analog controls VOFF1_x, VOFF3_x and IVGAIN_x, where x refers to channel A, B, C, or D corresponding to channels 1, 2, 3, and 4. VOFF1_x is the offset control in 50 Ohm coupling,, VOFF3_x is used to control the offset of the 50 Ohm path when in 1 MOHm coupling and IVGAIN_x is used to calibrate the gain of the front end and perform the variable gain control.
- The DAC dynamic range (± 10V) is scaled to the proper range by means of resistor dividers.

The addresses are :

0300 0000	write channel A gain control
0300 0002	write channel A offset control
0300 0004	write channel B gain control
0300 0006	write channel B offset control
0300 0008	write channel C gain control
0300 000a	write channel C offset control
0300 000c	write channel D gain control
0300 000e	write channel D offset control

4.2.4 Trigger

The different trigger couplings are :

- DC
- AC : cut off frequency approximately 10 Hz.
- LF REJ: a single pole high pass filter with a cut off frequency at 50 kHz.
- HF REJ: a single pole low pass filter with a cut off frequency at 50 kHz.
- HF: divides the trigger frequency by two.

The amplitude at the input of the MTR408 is approximately 400 mV FS (identical to the ADC system),

4.2.4.1 Digital Controls

The 40 bit shift register, is allocated as follows :

0141 4z00 - 0141 4zff write trigger control register

39							32
—	TBWL_A	HFR_A	AC_A	DC_A	—	SNEG_A	SPOS_A
31							24
TEXT50	TBWL_B	HFR_B	AC_B	DC_B	—	SNEG_B	SPOS_B
23							16
—	TBWL_C	HFR_C	AC_C	DC_C	—	SNEG_C	SPOS_C
15							8
—	TBWL_D	HFR_D	AC_D	DC_D	—	SNEG_D	SPOS_D
7							0
_EXT/10	TBWL_EXT	HFR_EXT	AC_EXT	DC_EXT	—	SNEG_EXT	SPOS_EXT

TEXT50 0 = 1 MΩ external input coupling, 1 = 50 Ω external input coupling.

_EXT/10 0 = attenuation is ON, 1 = OFF.

4.2.4.2 Analog Controls

A sample and hold fed by the precision DAC provides the threshold level.

The addresses are :

0300 0010	write EXT threshold control
0300 0018	write channel A threshold control
0300 001a	write channel B threshold control
0300 001c	write channel C threshold control
0300 001e	write channel D threshold control

4.2.4.3 TV Trigger

Each channel has an analog pick-off for the tv trigger after the HFE624. The external trigger has a pickoff after the high impedance buffer. The TV trigger source is selected via the three bits of TVS and drives an amplifier with complementary outputs. These outputs are selected by _TVINV.
The TV trigger uses a commercial chip (LM1881) and provides two outputs,TV1 & TV2. This circuit is able to trigger on several different TV line number standards.

- **Digital Controls**

The 16 bit shift register, written using the serial protocol, is allocated as follows :

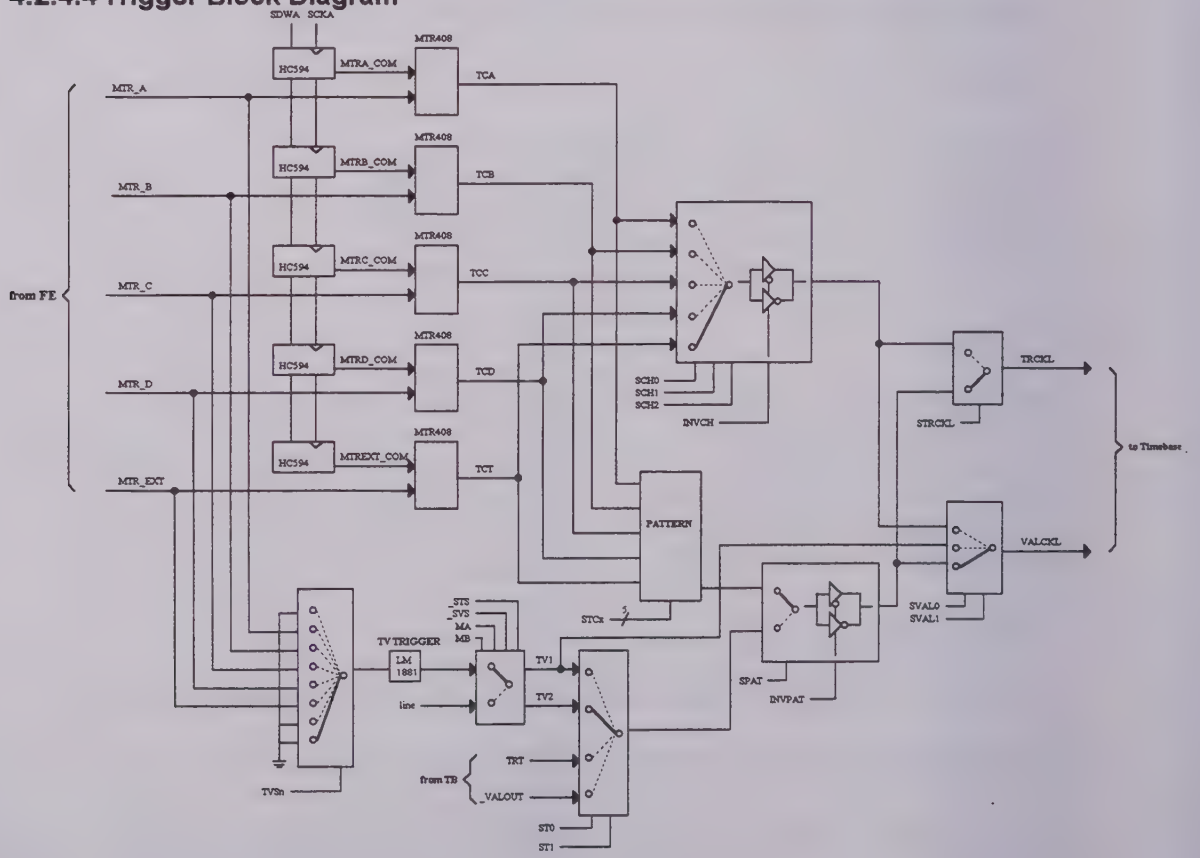
0141 5z00 - 0141 5zffwrite trigger TV and MST412 oscillator control register

15							8
_TVINV	TVS2	TVS1	TVS0	HDTV	875	MB	MA
7							0
_STI	_STW	_SVS	STS	—	—	—	—

_TVINV 0 = inverting TV trigger (to compensate for inversion in MFE409).
_SVS 0 = enable TV1 source.
_STS 0 = enable TV2 source.
_STI 0 = enable interval width mode for MST412 oscillator control.
_STW 0 = enable pulse width mode for MST412 oscillator control.

TVS2	TVS1	TVS0	TV trigger source	HDTV	875	line setting
0	0	1	channel A	0	0	525-625 TVLO
0	1	0	channel B	0	1	875 (MED)
0	1	1	channel C	1	0	1225 (HIGH)
1	0	0	channel D	1	1	2500 (HDTV)
1	0	1	external trigger			

4.2.4.4 Trigger Block Diagram



4.2.5 Analog to Digital Converter

4.2.5.1 Introduction

The analog to digital converter system does the signal conversion to 8 bits. Each channel has a custom hybrid, HAD621, that contains two identical channels A and B consisting of a sample and hold, MSH417, and an ADC, TDA8718. Each hybrid is followed by a data demultiplexer, MDX622 and memory.

- Sample and Hold : the MSH417 with an analog bandwidth of 1GHz, performs the track and hold before the ADC. It is clocked at three different frequencies : 500 MHz, 400 MHz, and 200 MHz. The offset difference between the two channels in the HAD621 is adjusted by an 8 bit DAC.

- Flash ADC : the TDA8718 is a folding ADC working at a maximum clock speed of 500 MS/s. The gain difference between channels in the HAD621 is calibrated by adjusting the internal resistor ladder using an 8 bit DAC. The ADC input level is nominally 2 volts peak to peak.

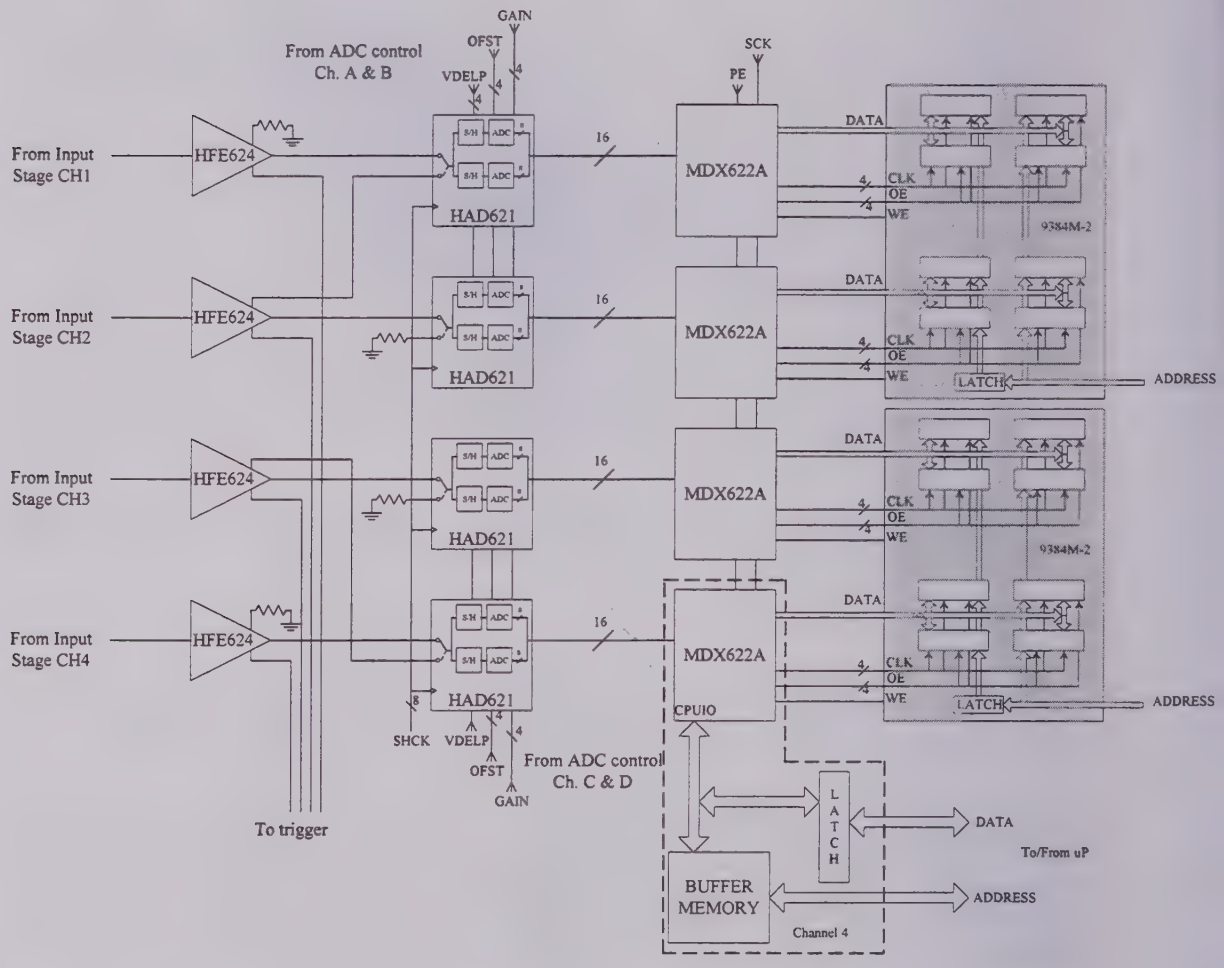
- Demultiplexer : the MDX622 monolithic is used to demultiplex the ADC output for the slower memories and to peak detect the data on the fly.

- Buffer Memory : 128K bytes

- ADC Memory : 100 K for the LC574A, 500 K for the LC574AM and 2 M for the LC574AL. Memory length may be extended by combining the acquisition memories of multiple channels to a maximum of 8 Mpoints for one channel.

Any time two channels are interleaved to produce a higher sample rate, the timing between the S/H's must be precise. A square wave oscillator at a frequency of 15.5029 MHz provides the edge required to calibrate the timing. The square wave is injected into the 50 ohm signal path at the buffer driving the HFE624 and is used by the software to calibrate out this internal delay.

4.2.5.2 ADC/Memories Block Diagram



4.2.6 Time Base

4.2.6.1 Introduction

The main clock comes from a PLL oscillator that uses a precision 10 MHz reference. There is a control bit, SEXTREF, to select an optional external reference providing a 0 dbm signal level.

The PLL output frequency is controlled by three bits, SF500, SF400, and _SF200. One branch of the main clock, SHCK, is directly used by the sample-and-hold, the analog-to-digital converter and the time-to-digital converter for data acquisition. A differential ECL clock from each channel, called MCK, synchronizes the MDX622 data demultiplexer with the data from the ADC.

Another branch of the main clock, MDXCK, is routed to the time where the basic timing of the oscilloscope is generated. A programmable divider using a fast ECL first stage and a slower TTL second stage generate a signal called SAMPLE CLOCK. A second programmable ECL divider uses SAMPLE CLOCK to generate the timing signals for the MDX622 data demultiplexers, the time to digital converter, the trigger recognizer, and the MTB411 timebase.

The main clock can also be driven from the external trigger BNC, this path is selected by a control bit (SEXTCK). The external clock threshold can be modified by two bits from the time base mode control (EXTCTH1 and EXTCTH2). This external clock frequency range is 0 to 100 MHz. An optional rear panel input can drive the external clock to 500 MS/s.

The PLL oscillator has in fact only two values, 500 and 400 MHz, the 200 MHz is a secondary path coming from a divide by two.

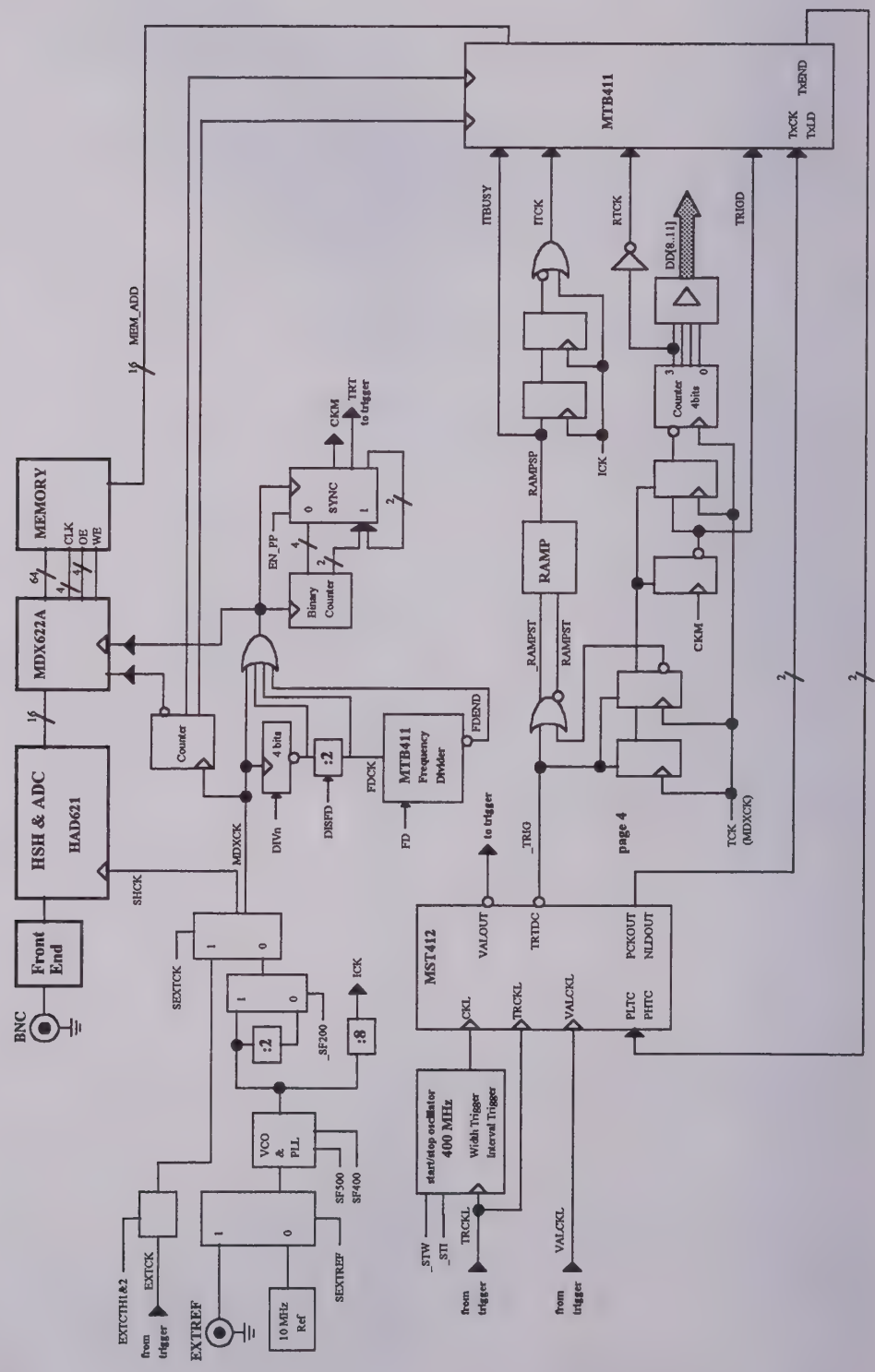
- 500 MHz is used for the fast timebase settings, 250 MS/s, 500 MS/s, 1 GS/s, 2 GS/s, 4 GS/s and RIS mode.

- 400 MHz is used for all other timebase settings including Roll mode.

The time to digital converter is a variation on the classic Wilkinson charge to time converter. The capacitor is charged by the time difference between the trigger and the main clock, while the discharge is controlled by a fixed current source approximately 0.001 times the charging current. The MTB411 counts a clock called ICK, which is 1/8 th. of the main clock, during the discharge part of the TDC. The value of the counter after the discharge cycle is proprotional to the time difference.

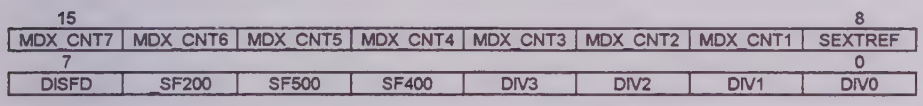
Another clock called TRT, derived from the main clock is used by the processor to calibrate the smart trigger.

4.2.6.2 Time Base Block Diagram



4.2.6.3 Digital Control

0141 8z00 - 0141 8zffwrite Time Base divider register



where :

- SEXTREF select optional external PLL clock reference (10 MHz ± 5 %).
- DISFD disable FD clock to MTB411.
- _SF200 select oscillator frequency 200 MHz.
- SF500 select oscillator frequency 500 MHz.
- SF400 select oscillator frequency 400 MHz.
- DIVn frequency pre-divider (4 bits).
- MDX_CNT1:7 master MDX622 divider.

4.2.6.4 Trigger Selection

Each differential output of the five MTR408's from the Front-End (TCx) are selected (bit SCHn) and then inverted (bit INVCH) to drive the TRCKL signal and the VALCKL signal (bit SVAL1).

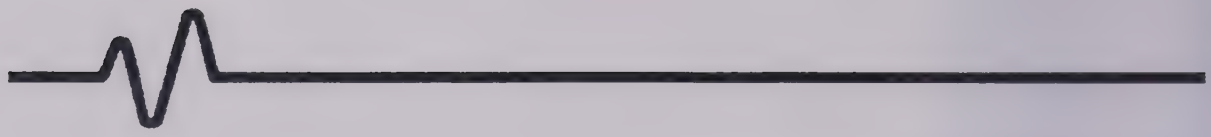
A logical function of the TCx signals can be selected (bit STCx) for the pattern generator. A few single ended signals can also be selected one at a time (bit STn). These signals are TV1 and TV2 for television trigger, TRT for test and calibration of MST412, _VALOUT for drop-out trigger.

Then there is a selection between the pattern and the single ended sources (bit SPAT). The signal obtained is inverted (bit INVPAT) and used to drive TRCKL (bit STRCKL). There is also a choice between this signal and TV1 to drive VALCKL (bit SVAL0). The pattern trigger logic function is any "AND" combination of TCx input signals, inverted or not. All the controls are done through a 16 bit serial register.

4.2.6.5 Smart Trigger

The VALCKL source drives the MST412. The TRCKL source goes through a buffer to drive the MST412, the fast trigger latch, and control the smart trigger 400 MHz start/stop oscillator. The DC trigger coupling mode uses the fast trigger latch path for triggering to approximately 700 MHz. Selecting HF trigger coupling extends the trigger sensitivity to beyond 1 GHz.

The MST412 oscillator is usually free running, but when using glitch trigger mode, the oscillator is enabled only during the pulse duration (bit _STW), and when using interval width trigger mode the oscillator is restarted at each edge (bit _STI).
There is also a time base mode control register with roll mode interrupt enable (RMIE), external clock control (SEXTCK, EXTCTH1 and EXTCTH2), buzzer (BUZZ) and calibration front panel output signal selection (PCSn).



4.3 F9300-4 GPIB and RS 232 Interface

This board is connected to the processor through a flat cable.
Data bus is 8 bits, address bus: 12 bits.
Address 0180 000 to 0180 00FF.

4.3.1 RS 232 Serial Interface

Based on the 2661A IC from Signetics or Philips.

- Clock frequency 4.9152 MHz.
- RTC/CTS signals are connected
- DCD input is biased and the DTR output is not wired
- 4 internal registers of 8 bits.
- Interrupt level 2.
- Connector compatible with a DB9-P (9 pin male).

4.3.2 GPIB Interface

Based on the circuit 7210 IC from NEC.

- Clock frequency 4.9152 MHz.
- 8 internal registers of 8 bits.
- Tri-state external GPIB drivers. - Low level output.
- Interrupt level 3.

The GPIB address is set by software and stored in non-volatile memory.

4.4 FP9604 Front Panel

The front panel is connected to the processor board with a flat cable. Power supply and control signals are supplied from the processor. The front panel is divided in two sections:

- F9604-5 board with Motorola 68HC05C4 processor, encoders, and serial data interface.
- F9602-5 matrix keypad with push buttons.

4.5 F9300-7 Printer Controller Option

- Based on the Internal graphic printer LPT5446, and LPT5000 series control chip set from Seiko instrument Inc (Technical reference 39019-2234-01)
- PT501P01 CPU
- PT500GA1 Gate array
- Address 0130 0100
- Interrupt level 2

4.6 PSLC574 Power Supply

Line Voltage Autoranging

The LC574A oscilloscope operates from a 115 V (90 to 130 V) or 220 V (180 to 260 V) normal power source at 47 Hz to 63Hz. No voltage selection is required since the instrument automatically adapts to the line voltage which is present. The instrument operates at line frequencies up to 440 Hz.

4.6.1 Power Supply Specifications

Input voltage : 90 to 130 V or 180 to 260 V.
Auto ranging line voltage.

Input frequency : 47 Hz to 63 Hz.

Input rush current : Max. 40 A peak at start up.

Environmental : Operating temperature range 0 °C to + 50 °C
Storage temperature range - 55 °C to + 80 °C
Relative humidity from 5% to 95%.

Output voltages : - 5.2 VDC, 13 amp Max.
+ 5.2 VDC, 6 amp Max.
- 15.1 VDC, 3 amp Max
+ 15.1 VDC, 3 amp Max.
- 2.1 VDC, 10 amp Max.
+ 3.3 VDC, 3 amp Max.

Output adjustment : +/- 5%.
Regulation : +/- 1%.

Transient response : recover to 1% of its final value within 500 μsec.

Ripple and noise : Peak to peak value < 50 mV

Hold up time : 16 msec at full load

Output short circuit protection : Yes.

Output over voltage protection : Yes.

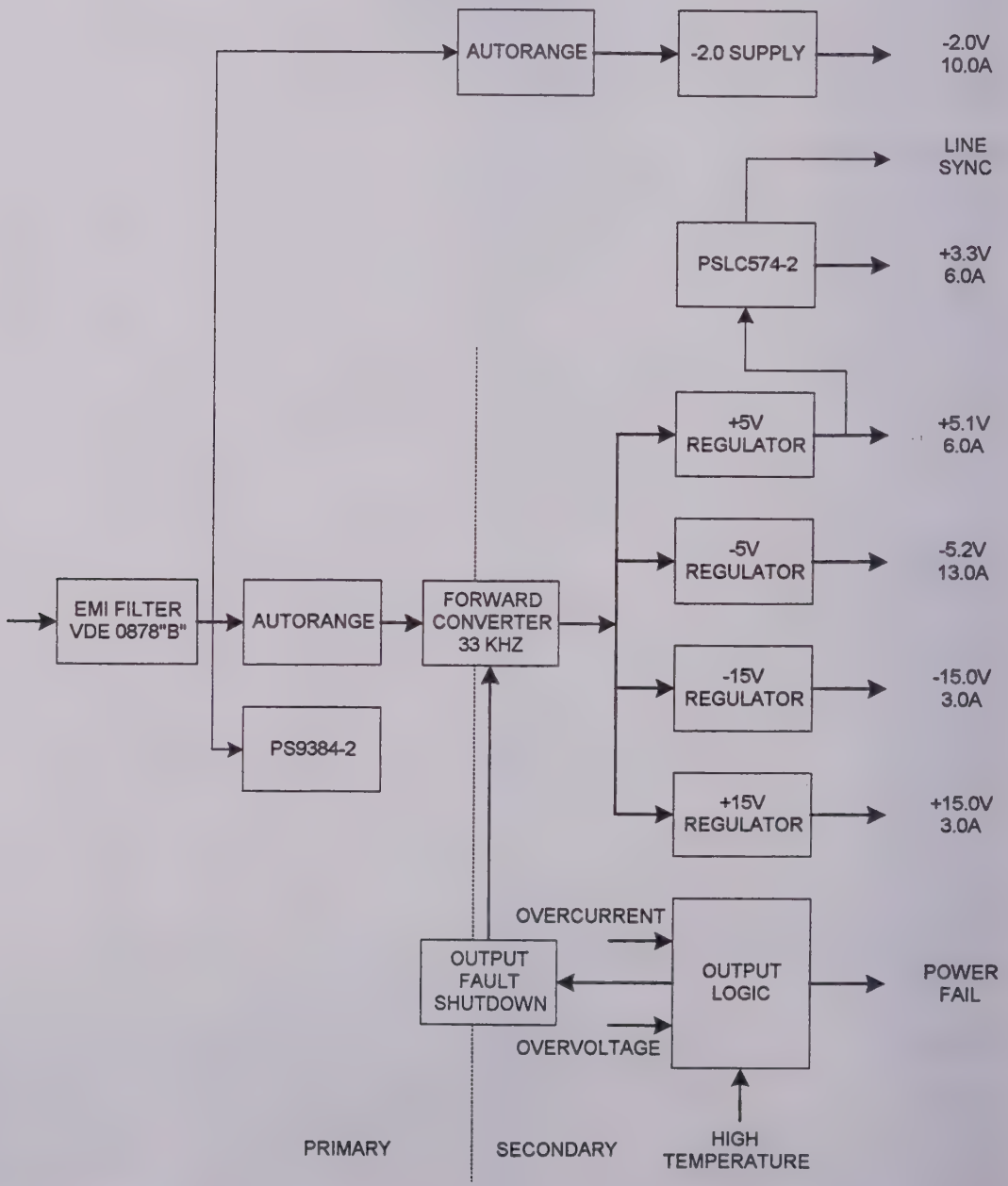
Input protection : 6 amp fuses.
Thermal protection : Yes.

Safety : VDE 0806, IEC 380, 435, 950 & UL1012, 478, CSAC22.2#1402C
EMI : VDE 0871 class A, FCC 20780 class A.

4.6.2 Power Supply Configurations

There are two different power supplies which may be present in the LC574A. They are the PSLC574 and the 900024. The 900024 has a fan on the front of the power supply while the PSLC574 does not. The presence of a fan is based on the type of fan used in the rear of the unit.

4.6.3 Power Supply Block Diagram



5. Performance Verification Procedures

5.1 Introduction

This chapter contains procedures suitable for determining if the LC574A Digital Storage Oscilloscope performs as warranted.
They check all the characteristics that are designated as specifications in subsection 5.1.1.

Because they require time and suitable test equipment, you may not need to perform all of these procedures, depending on what you want to accomplish.

In the absence of the computer automated calibration system based on LeCroy Calibration Software (LeCalsoft), this manual performance verification procedure can be followed to establish a traceable calibration.
It is the calibrating entities' responsibility to ensure that all laboratory standards used to perform this procedure are operating within their specifications and traceable to required standards if a traceable calibration certificate is to be issued for the LC574A Digital Storage Oscilloscope.

5.1.1 List of Specifications

The electrical specifications described in terms of quantifiable performance limits are listed in this subsection.

- Input Impedance
- Leakage Current
- Peak to Peak and RMS Average noise level
- Positive and Negative DC linearity
- Positive and Negative Offset
- Bandwidth
- Trigger Level
- Smart Trigger
- Time Base Accuracy
- Overshoot and Rise Time
- Overload

5.1.2 Calibration Cycle

The LC574A Digital Storage Oscilloscope requires periodic verification of performance. Under normal use (2,000 hours of use per year) and environmental conditions, this instrument should be calibrated once a year.

5.2 Test Equipment Required

These procedures use external, traceable signal generators, DC precision power supply, step generator and digital multimeter, to directly check specifications.

Instrument	Specifications	Recommended
Signal Generator Radio Frequency	Frequency : .5 MHz to 2 GHz Frequency Accuracy : 1 PPM	HP8648B or equivalent
Signal Generator Audio Frequency	Frequency : 0 to 5 KHz Amplitude : 8 V peak to peak	LeCroy LW420 or HP33120A or equivalent
Voltage Generator DC Power Supply	Range of 0 to 20 V, in steps of no more than 15 mV	HP6633A or equivalent
Step Generator Fast Pulser	Rise time 350ps ± 100 ps Overshoot 3.5 % ± 1 %	LeCroy 4969A + PB049 or equivalent
Power Meter + Sensor	Accuracy ±1 %	HP436A + 8482A or equivalent
Digital Multimeter Volt & Ohm	Voltmeter Accuracy : 0.1 % Ohmmeter Accuracy : 0.1 %	Keithley 2000 or equivalent
Adapter	50Ω to 1MΩ	LeCroy 4962-9
Adapter	4 GS/s, Single channel mode	LeCroy PP094
Coaxial Cable, 1 ns	50Ω, BNC, length 20 cm,	LeCroy 480232001
Coaxial Cable, 5 ns	50Ω, BNC, length 100 cm,	LeCroy 480020101
Attenuators, 20 dB	50Ω, BNC, 1 % accuracy, 2GHz	LeCroy 402200402
Terminator, 2 W	50Ω, BNC, Feed-Through	LeCroy 402323001
T adapter	50Ω, BNC T adapter	LeCroy 402222002

Table 5-1 : Test Equipment

5.2.1 Test Records

The last pages of this chapter contain LC574A test records in the format tables. Keep them as masters and use a photocopy for each calibration.

5.3 Turn On

If you are not familiar with operating the LC574A, read the operator's manual.

- Switch on the power using the power switch.
- Wait for about 10 minutes for the scope to reach a stable operating temperature, and verify :

* the display turns on after about 10 seconds and is stable.
* the range of intensity and grid intensity is reasonable.

5.4 Input Impedance

Specifications

DC 1.00 MΩ ±1 %
DC 50Ω ±1 %

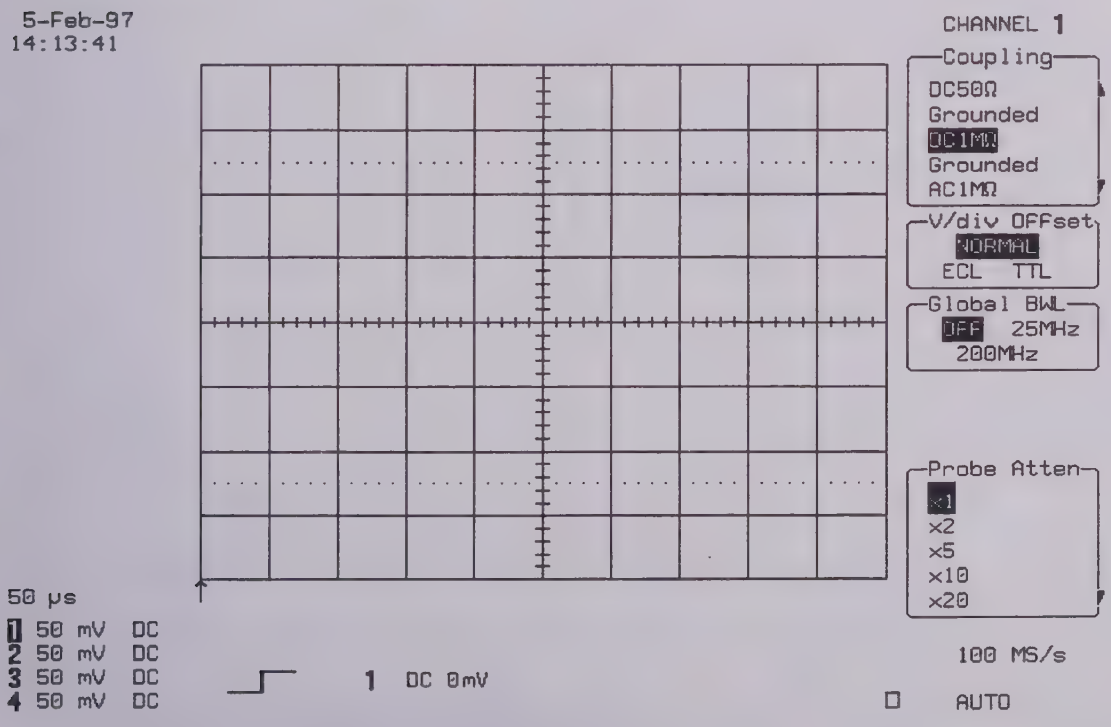
The impedance values for 50Ω, 1MΩ and Gnd couplings are measured with a high precision digital multimeter. The DMM is connected to the DSO in 4 wire configuration (input and sense), allowing for accurate measurements.

5.4.1 Channel Input Impedance

a. DC 1MΩ

- Recall **574p001.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace OFF		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 1MΩ** on all 4 Channels
Input gain	:	**50 mV/div.** on all 4 Channels
Time base	:	**50 µsec/div.**
Trigger mode	:	**Auto**

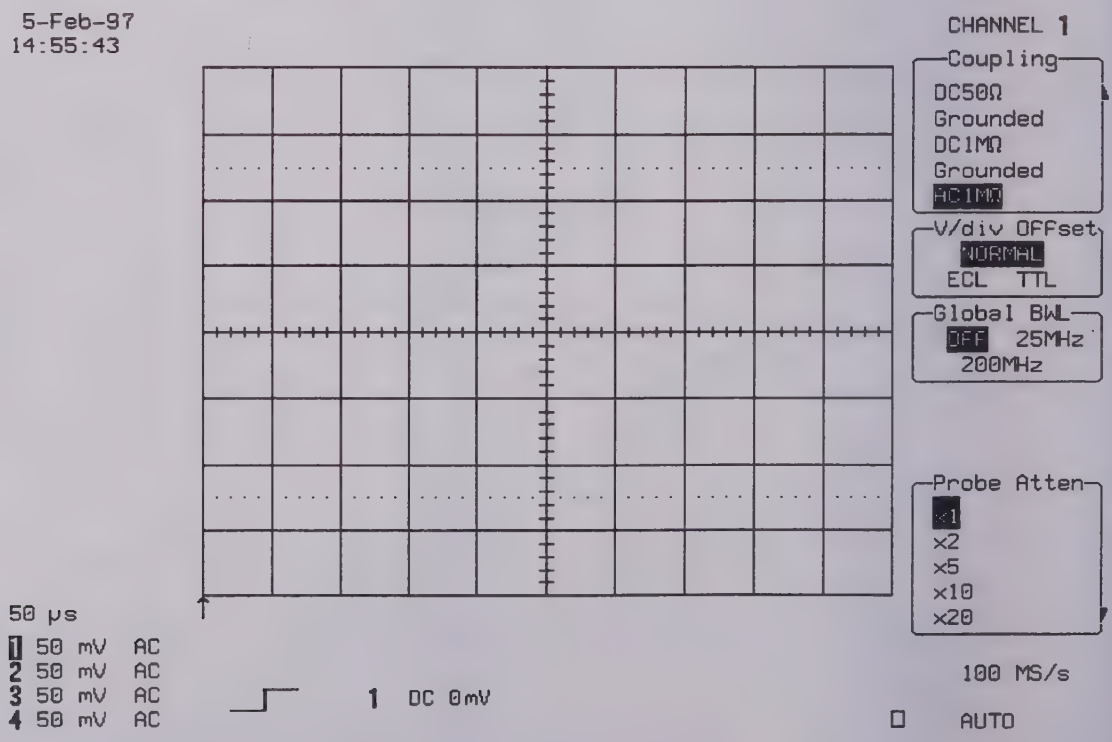


- Set the DMM with **Ohms and Ohms sense** to provide a 4 wire measurement.
- Connect it to Channel 1.
- Measure the **input impedance**. Record it in Table 2, and compare it to the limits.
- Repeat the above test for all input channels.
- Recall **574p002.PNL** or Set Input gain to **200 mV/div.** on all 4 Channels
- Repeat the test for all input channels.
- Record the measurements in Table 2, and compare the test results to the limits in the test record.

b. AC 1MΩ

- Recall **574p003.PNL** or configure the DSO as shown in 5.4.1.a, and for each Channel make the following change :

  Input Coupling : **AC 1MΩ**



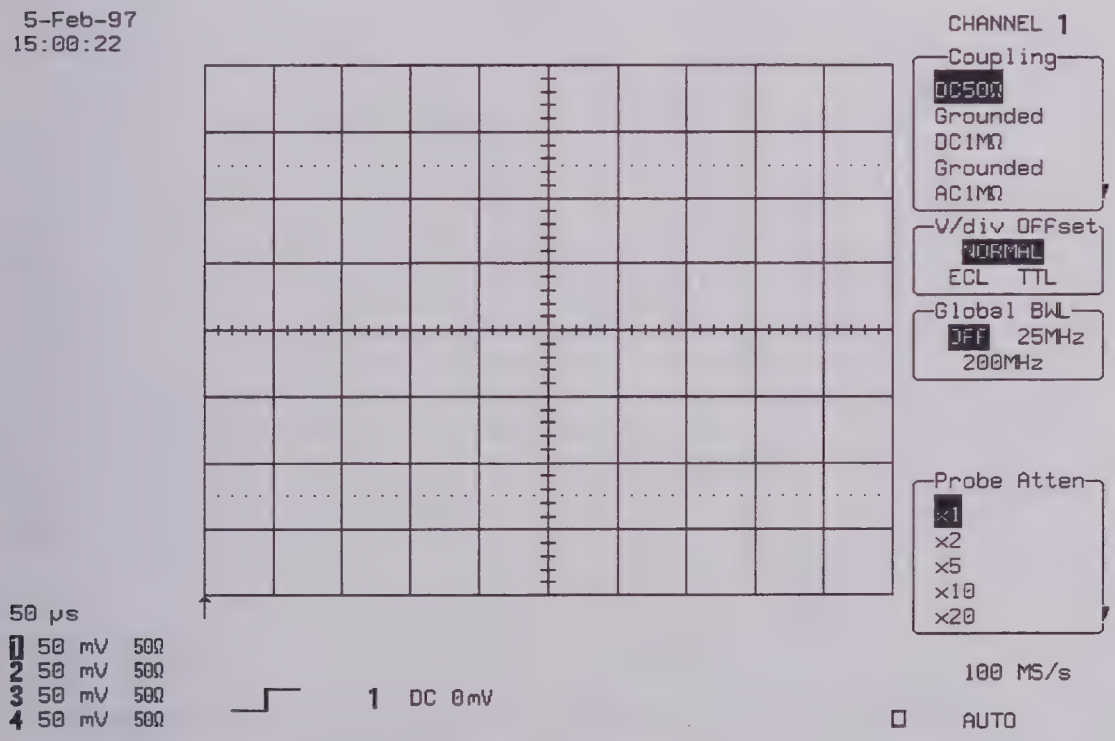
- For all input channels measure the **input impedance**.

- Record the input impedance in Table 2, and compare it to the limits.
- Recall **574p004.PNL** or Set Input gain to **200 mV/div** on all 4 Channels.
- Repeat the test for all input channels.
- Record the measurements in Table 2, and compare the results to the limits in the test record.

c. DC 50Ω

- Recall **574p005.PNL** or configure the DSO as shown in 5.4.1.a, and for each Channel make the following change:

  Input Coupling : **DC 50Ω**



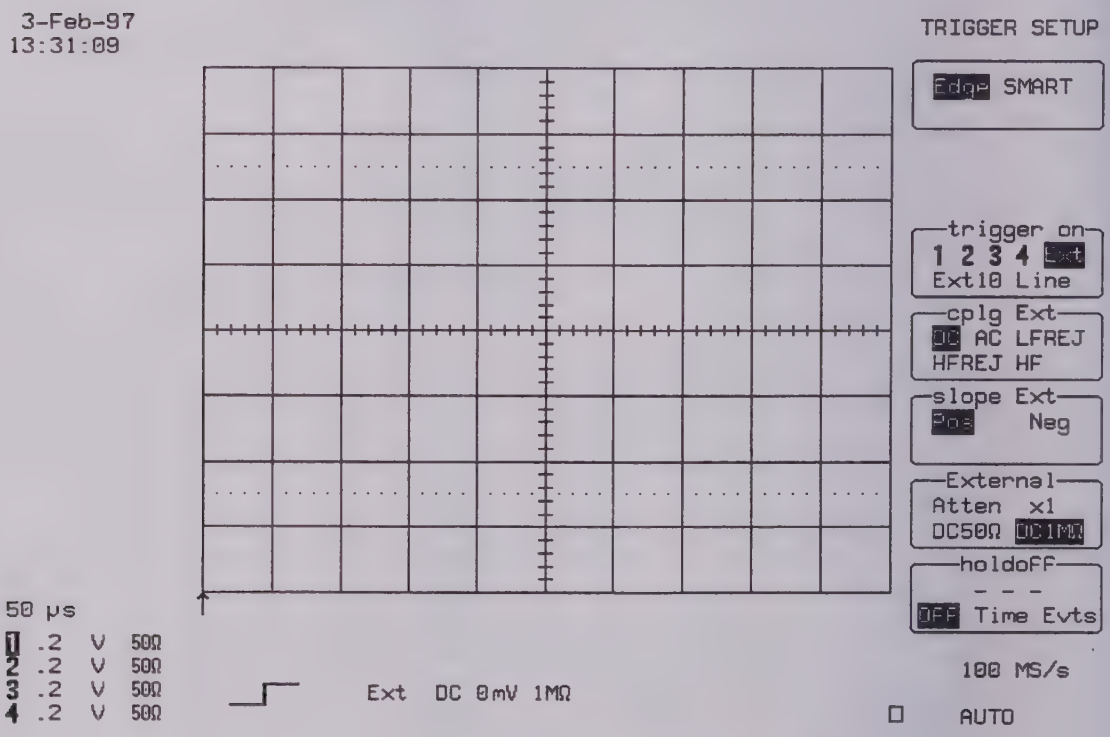
- For all input Channels, measure the input impedance.
- Record the **input impedance** in Table 2, and compare it to the limits.
- Recall **574p006.PNL** or set Input gain to **200 mV/div.** on all 4 Channels
- Repeat the test for all input channels. Record the measurements in Table 2, and compare the results to the limits in the test record.

5.4.2 External Trigger Input Impedance

a. DC 1MΩ

- Recall **574p007.PNL** or configure the DSO :

Set Trigger on	:	**EXT**
Trigger mode	:	**Auto**
Cplg Ext	:	**DC**
External	:	**DC 1MΩ**
Time base	:	**50 µsec/div.**



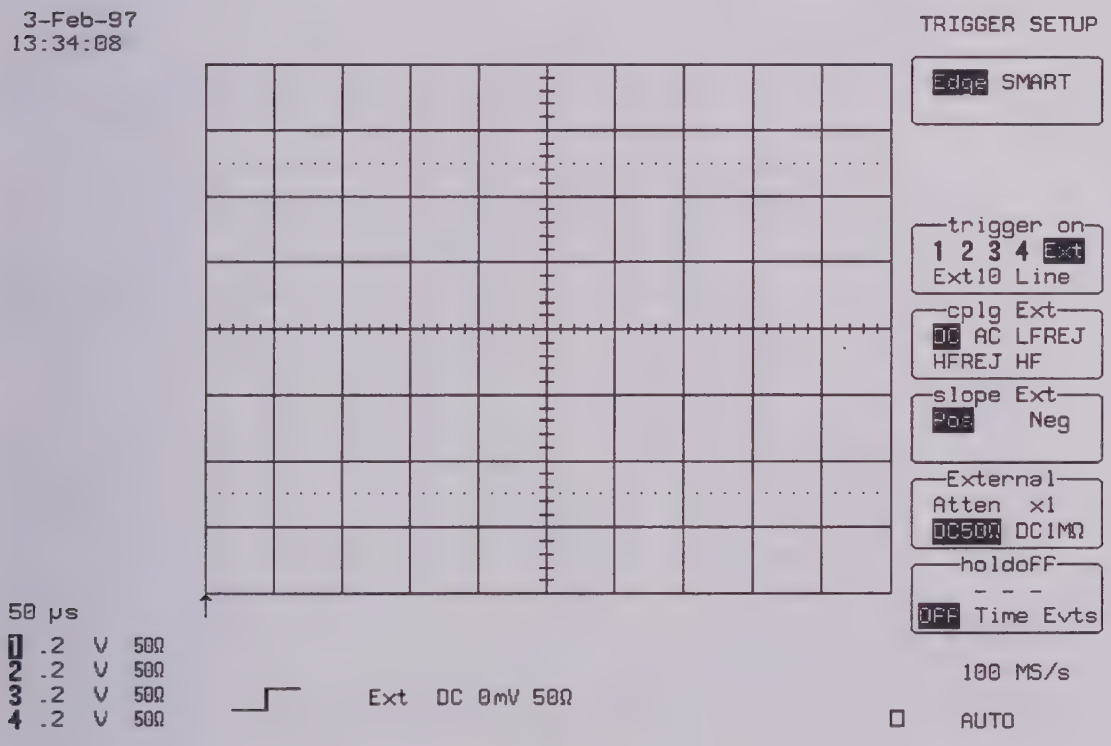
- Connect the DMM to External, and measure the **input impedance**.
- Record the input impedance in Table 2, and compare it to the limits.
- Recall **574p008.PNL** or set trigger to Ext/10
- Measure the **input impedance**.
- Record the test result in Table 2, and compare the result to the limits in the test record.

b. DC 50Ω

- Recall **574p009.PNL** or configure the DSO :

  Trigger on : **EXT**

  External : **DC 50Ω**

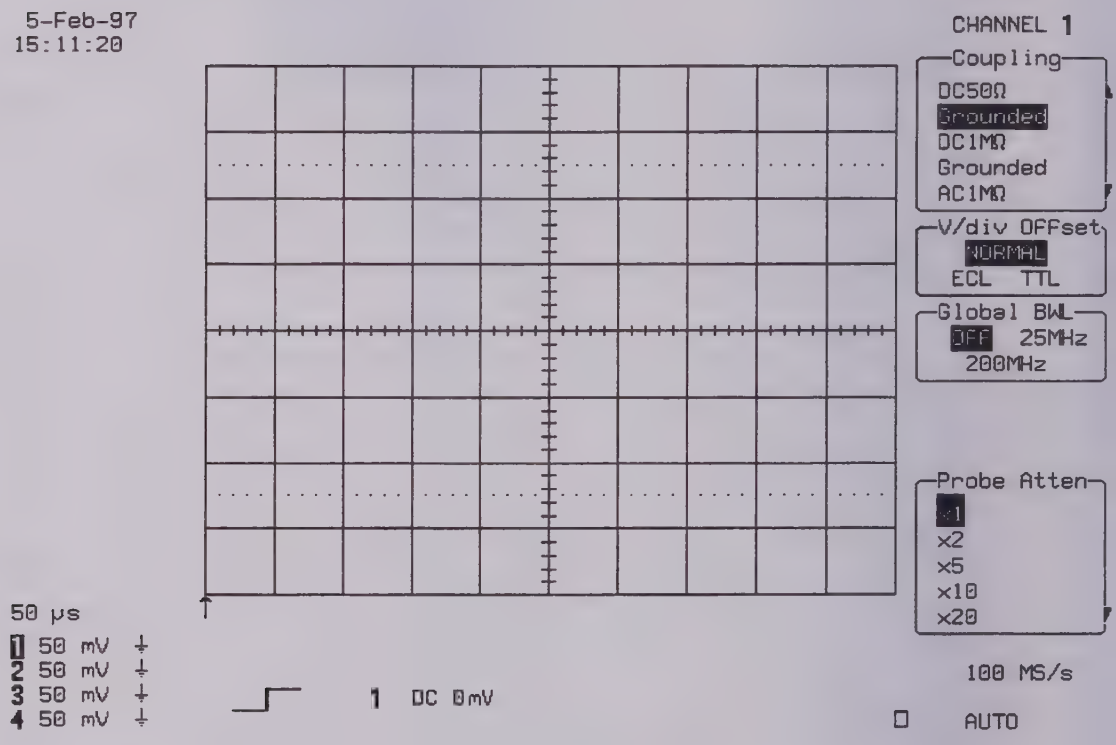


- Connect the DMM to External, and measure the **input impedance**.
- Record the input impedance in Table 2, and compare the result to the limit in the test record.

5.4.3 Ground

- Recall **574p010.PNL** or configure the DSO as shown in 5.4.1.a, and for each Channel make the following changes :

  Input Coupling : **Grounded**



- Connect the DMM to Channel 1, and measure the **input impedance.**
- Record the input impedance in Table 2, and compare the result to the limit in the test record.
- Repeat the test for all input channels.
- Record the measurements in Table 2, and compare the results to the limits in the test record.

5.5 Leakage Current

Specifications

DC 1MΩ, AC 1MΩ, DC 50Ω : ±1 mV

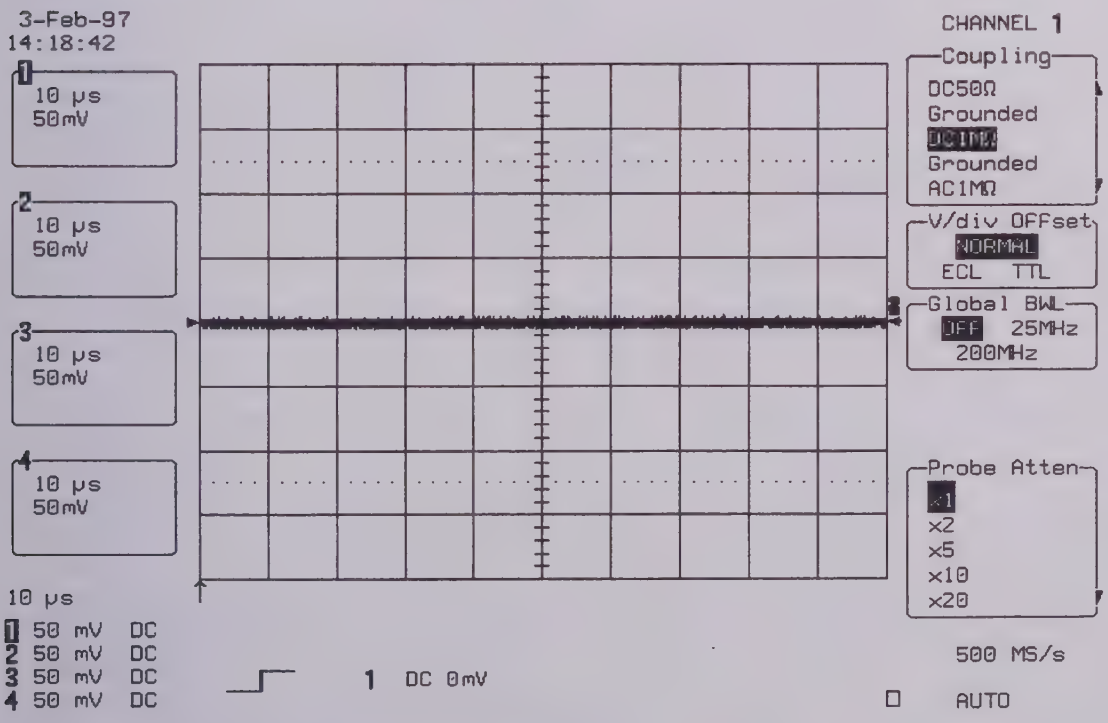
The leakage current is tested by measuring the voltage across the input channel.

5.5.1 Channel Leakage Current

a. DC 1MΩ

- Recall **574p011.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 1MΩ** on all 4 Channels
Input gain	:	**50 mV/div.** on all 4 Channels
Trigger mode	:	**Auto**
Time base	:	**10 µsec/div.**



- Set the DMM to measure Volts, and connect it to Channel 1.
- Measure the **voltage** and enter it in Table 3. Compare it to the limits.

- Repeat the test for all input channels.
- Recall **574p012.PNL** or set Input gain to **200 mV/div.** on all 4 Channels
- Repeat the test for all input channels. Record the measurements in Table 3, and compare the results to the limits in the test record.

b. DC 50Ω

- Recall **574p013.PNL** or configure the DSO as shown in 5.5.1.a and for each Channel make the following changes :

  Set Input Coupling: **DC 50Ω**

- Connect the DMM to Channel 1.
- Measure the **voltage** and enter it in Table 3. Compare it to the limits.
- Recall **574p014.PNL** or set Input gain to **200 mV/div.** on all 4 Channels
- Repeat the test for all input channels.
- Record the measurements in Table 3, and compare the results to the limits in the test record.

5.5.2 External Trigger Leakage Current

a. DC 50Ω

- Recall **574p015.PNL** or configure the DSO as shown in 5.5.1.a and make the following changes :

  Set Trigger on : **EXT**

  External : **DC 50Ω**

- Connect the DMM to External.
- Measure the **voltage** and enter it in Table 3. Compare it to the limits.

5.6 Average Noise Level

Description

Noise tests with open inputs are executed on all channels for both 1MΩ and 50Ω input impedance, with AC and DC input coupling, 0 mV offset, at a gain setting of 10 mV/div., and different timebase settings.
The scope parameters functions are used to measure the Peak and RMS amplitude of the noise.

5.6.1 Peak to Peak Noise

Specifications

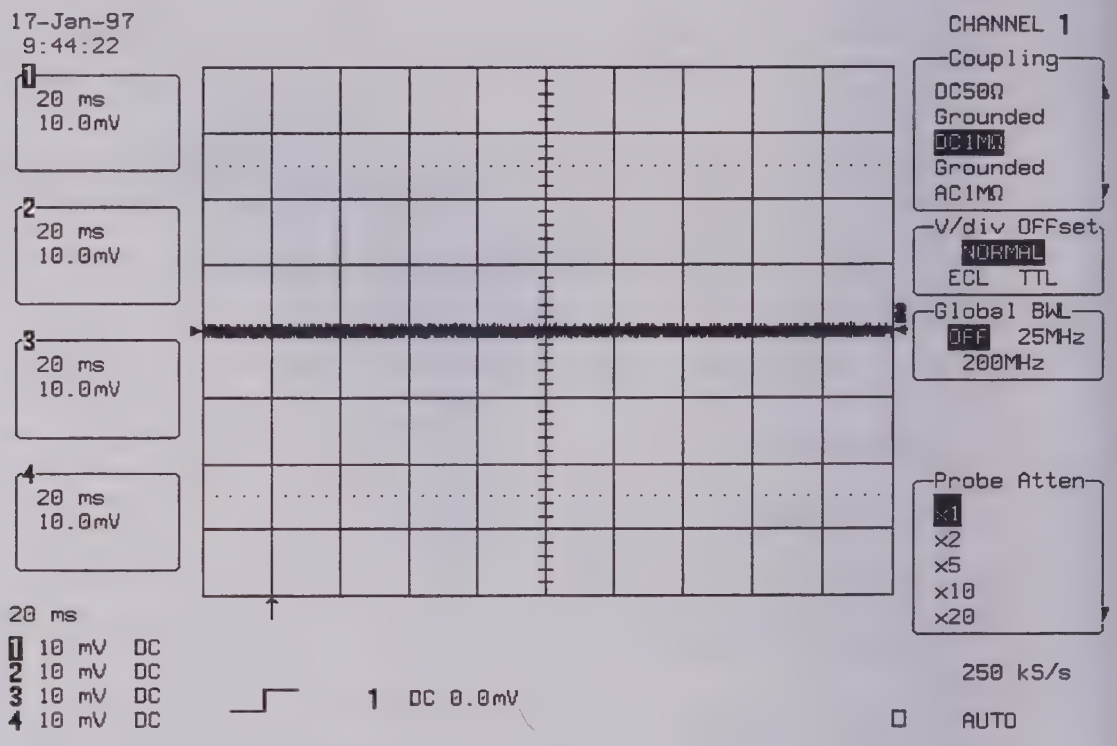
9 % of full scale or 7.2 mV Peak Peak at 10 mV/div.

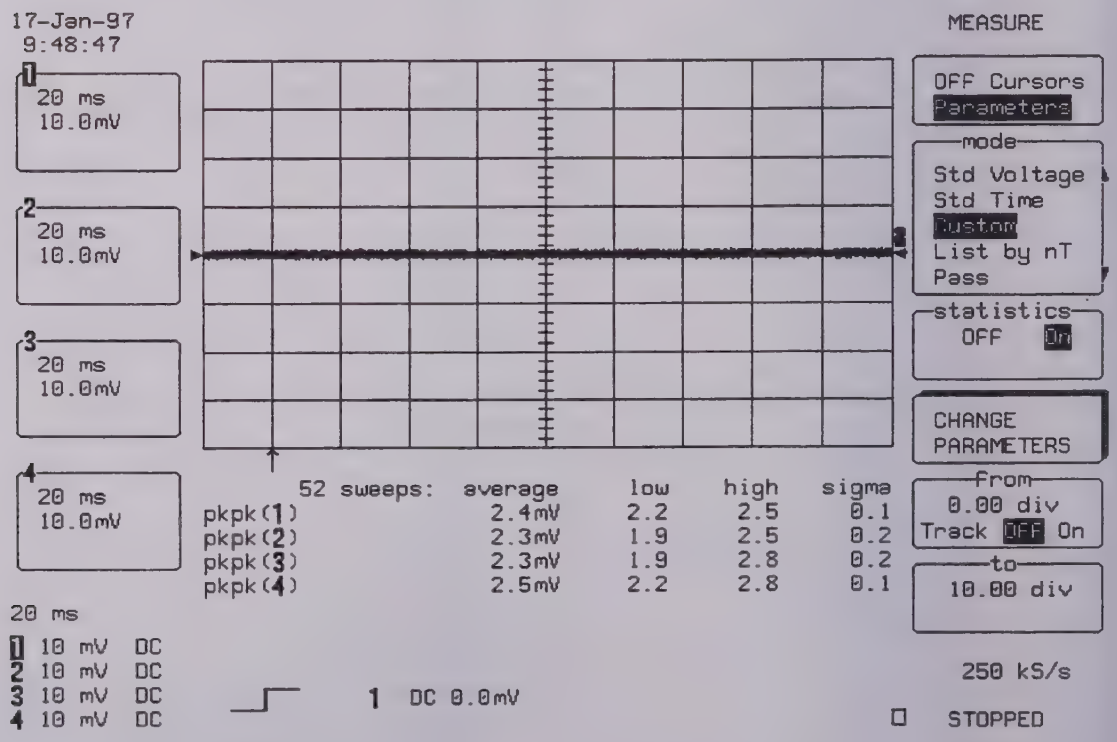
a. DC 1MΩ

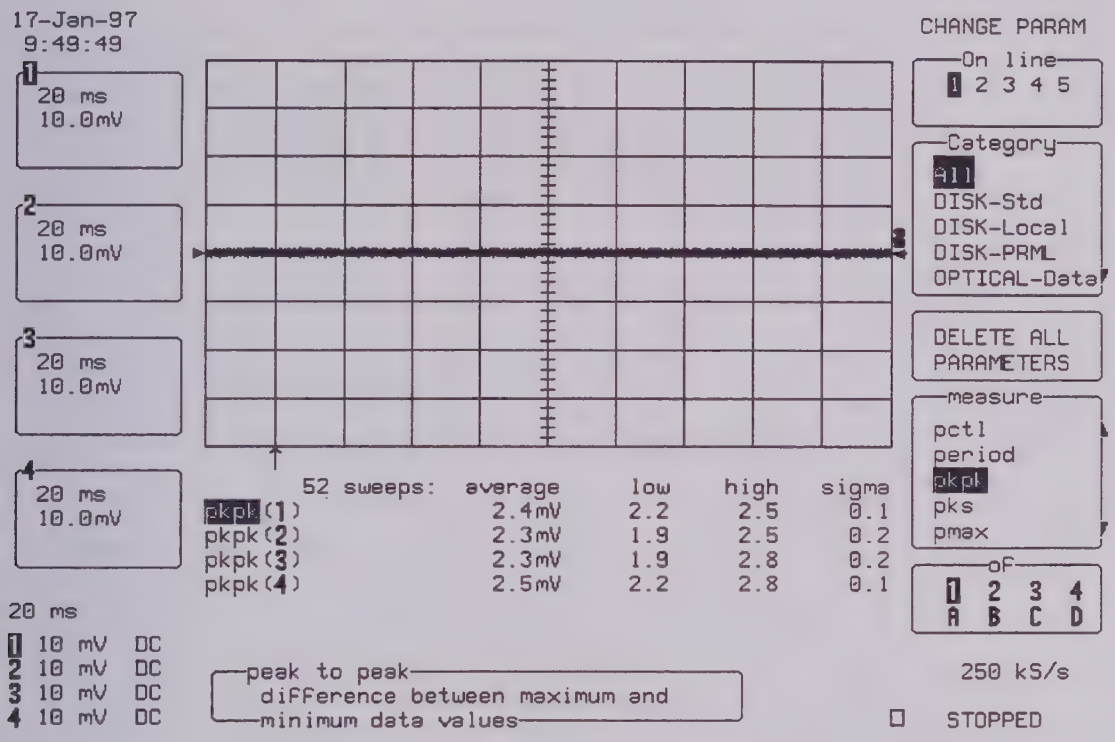
With no signal connected to the inputs

- Recall **574p016.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 1MΩ** on all 4 Channels
Input gain	:	**10 mV/div.** on all 4 Channels
Input offset	:	**0.0 mV** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**1**
Coupling 1	:	**DC**
Trigger Mode	:	**Auto**
Timebase	:	**20 msec/div.**
Channel use	:	**4**
Record up to	:	**50 k Samples**
Press	:	**Cursors/Measure**
Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**On**
Change parameters		
Category	:	**All**
On line 1	:	**Measure pkpk of Ch1**
On line 2	:	**Measure pkpk of Ch2**
On line 3	:	**Measure pkpk of Ch3**
On line 4	:	**Measure pkpk of Ch4**
On line 5	:	**no parameter selected for line 5**


17-Jan-97
9:44:22
CHANNEL 1
Coupling
DC50Ω
Grounded
DC1MΩ
Grounded
AC1MΩ
V/div OFFset
NORMAL
ECL TTL
Global BWL
OFF 25MHz
200MHz
Probe Atten
x1
x2
x5
x10
x20
1 20 ms 10.0mV
2 20 ms 10.0mV
3 20 ms 10.0mV
4 20 ms 10.0mV
20 ms
1 10 mV DC
2 10 mV DC
3 10 mV DC
4 10 mV DC
1 DC 0.0mV
250 kS/s
AUTO


17-Jan-97
9:48:47
MEASURE
OFF Cursors
Parameters
mode
Std Voltage
Std Time
Custom
List by nT
Pass
statistics
OFF On
CHANGE
PARAMETERS
from
0.00 div
Track OFF On
to
10.00 div
1 20 ms 10.0mV
2 20 ms 10.0mV
3 20 ms 10.0mV
4 20 ms 10.0mV
52 sweeps: average low high sigma
pkpk(1) 2.4mV 2.2 2.5 0.1
pkpk(2) 2.3mV 1.9 2.5 0.2
pkpk(3) 2.3mV 1.9 2.8 0.2
pkpk(4) 2.5mV 2.2 2.8 0.1
20 ms
1 10 mV DC
2 10 mV DC
3 10 mV DC
4 10 mV DC
1 DC 0.0mV
250 kS/s
STOPPED



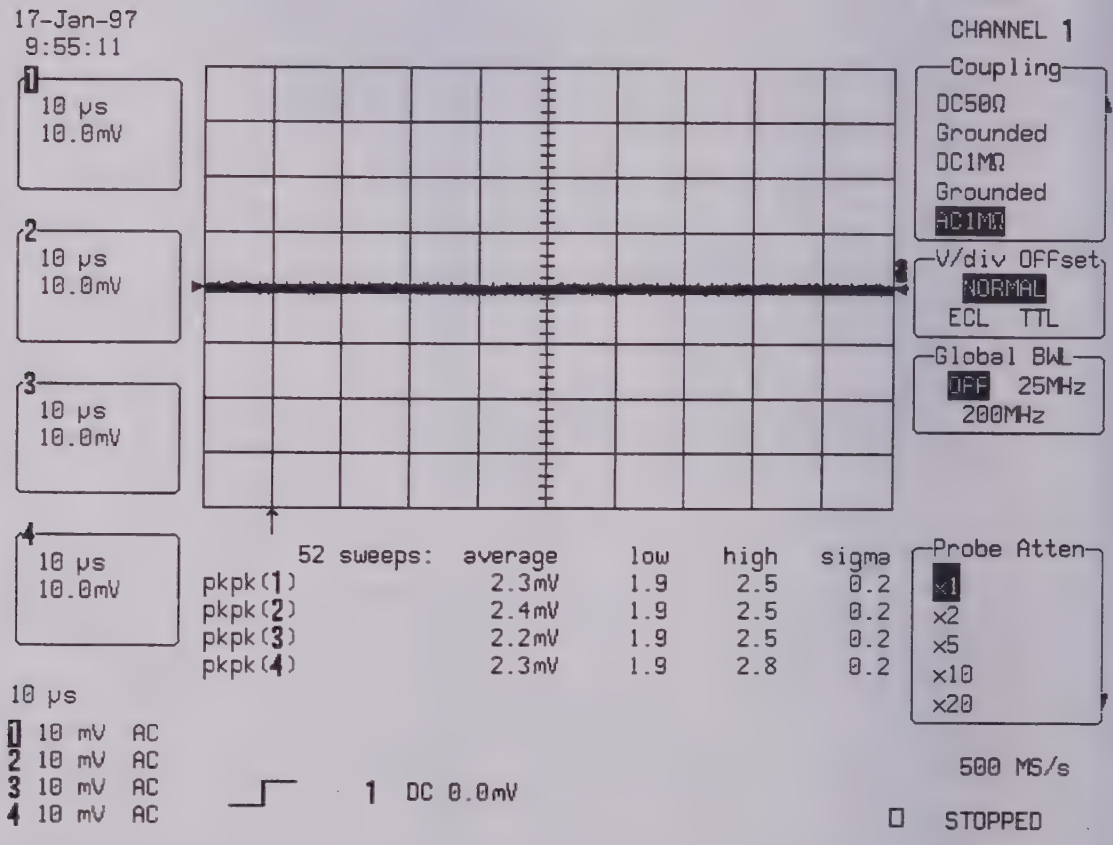
- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the four **high pkpk** parameter values in Table 4, and compare the test results to the limits in the test record.
- Repeat the test for Timebase : **1 msec/div.**, **50 μsec/div.**, and **10 μsec/div.**
- Record the measurements (high pkpk of 1,2,3,4) in Table 4, and compare the results to the limits in the test record.

b. AC 1MΩ

- Recall **574p017.PNL** or configure the DSO as shown in 5.6.1.a, and for each Channel make the following changes :

  Input Coupling : **AC 1MΩ**

- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the four **high pkpk** parameter values in Table 4, and compare the test results to the limits in the test record.



c. DC 50Ω

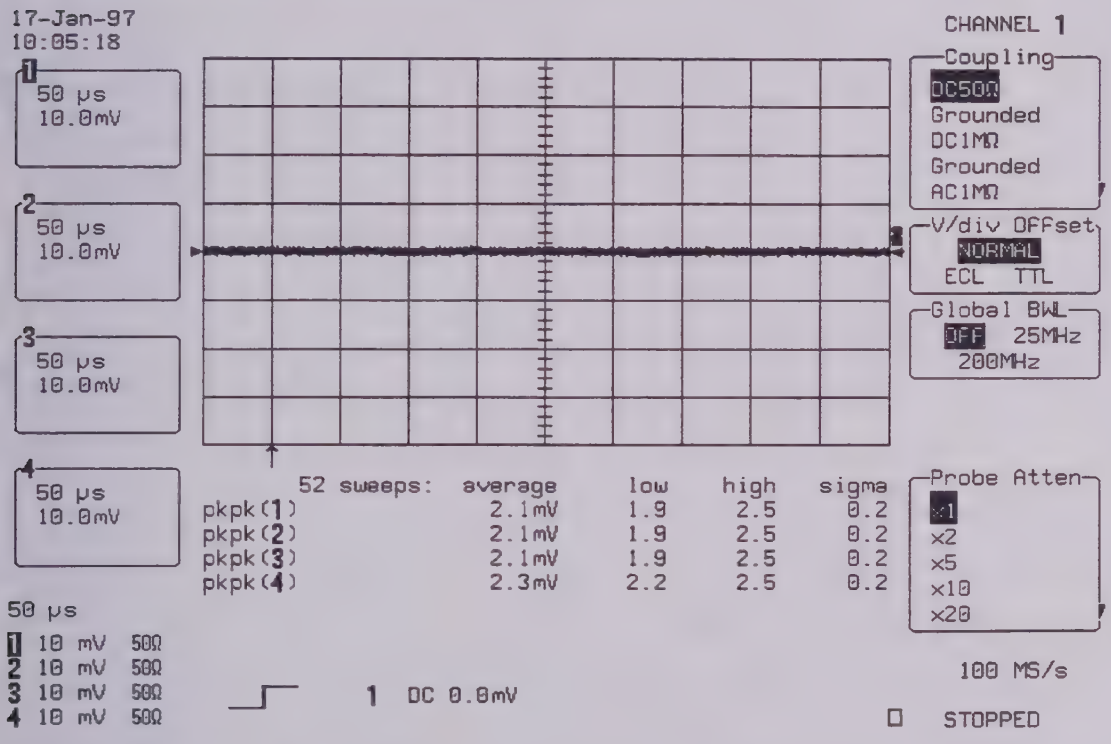
- Recall **574p018.PNL** or configure the DSO as shown in 5.6.1.a, and for each Channel make the following changes :

  Input Coupling : **DC 50Ω**

- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the four **high pkpk** parameter values in Table 4, and compare the test results to the limits in the test record.

- Repeat the test for Timebase : **50 µsec/div.**

- Record the measurements (high pkpk of 1,2,3,4) in Table 4, and compare the results to the limits in the test record.



d. DC 50Ω, 2 Channel Mode

- Recall **574p019.PNL** or configure the DSO as shown in 5.6.1.a. and make the following changes :

  Input Coupling : **DC 50Ω** on all 4 Channels

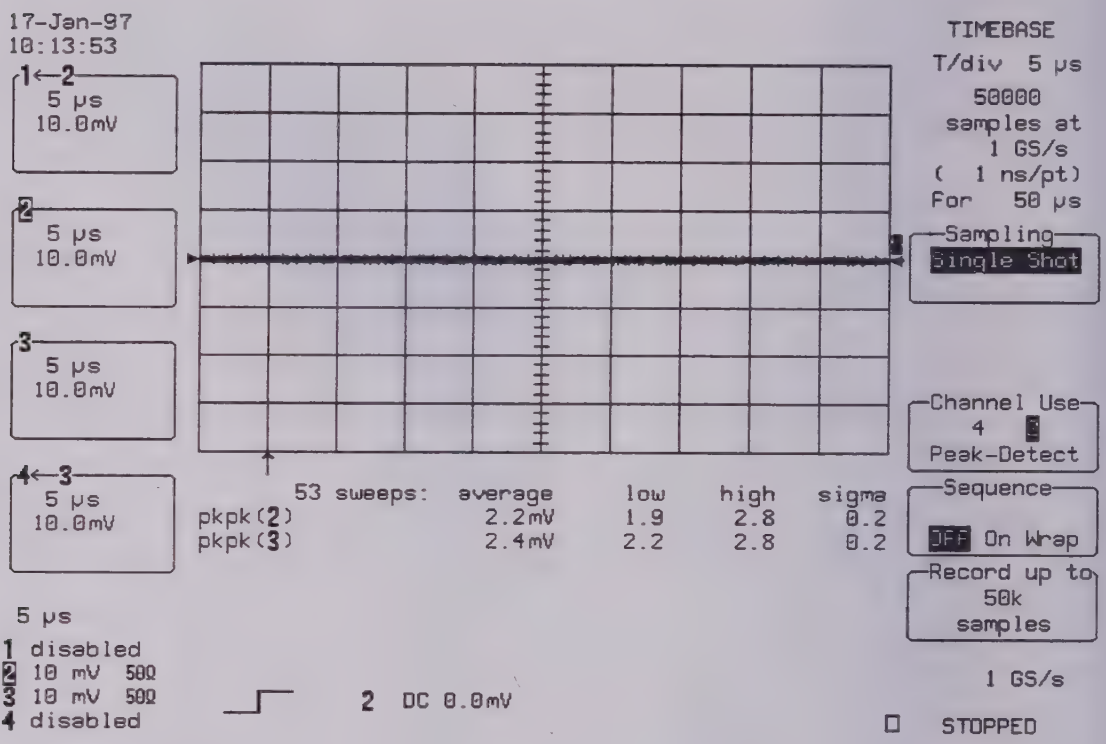
  Input gain : **10 mV/div.** on all 4 Channels

  Timebase : **5 µsec/div.**

  Select **Setup Timebase**

  Channel use : **2**
  Change parameters

  On line 1 : **Measure pkpk of Ch2**
  On line 2 : **Measure pkpk of Ch3**



- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the two **high pkpk** parameter values in Table 4, and compare the test results to the limits in the test record.

e. DC 50Ω, All Channels Combined

- Recall **574p020.PNL** or configure the DSO as shown in 5.6.1.a. and make the following changes :

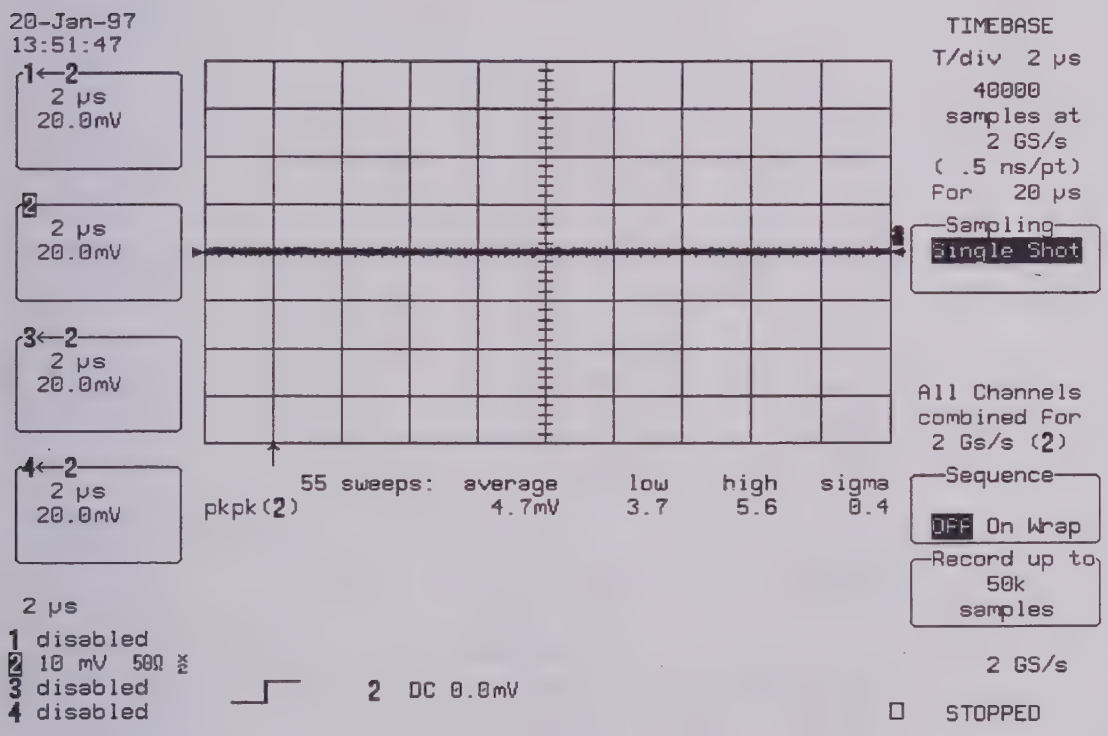
  Input Coupling : **DC 50Ω** on all 4 Channels

  Timebase : **2 µsec/div.**

  Change parameters
  On line 1 : **Measure pkpk of Ch2**

- Connect a **PP094** adapter to Channel 2 and Channel 3

- Check :
- PP094 is identified on **Channel 2.**
- Channel 1, Channel 3 and Channel 4 are **disabled**
- Sampling rate is **4 GS/s**



- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the **high pkpk** parameter value in Table 4, and compare the test result to the limits in the test record.
- Disconnect the **PP094** adapter.

5.6.2 Rms Noise

Specifications

0.9 % of full scale or 0.72 mV at 10 mV/div.

a. DC 1MΩ

Procedure

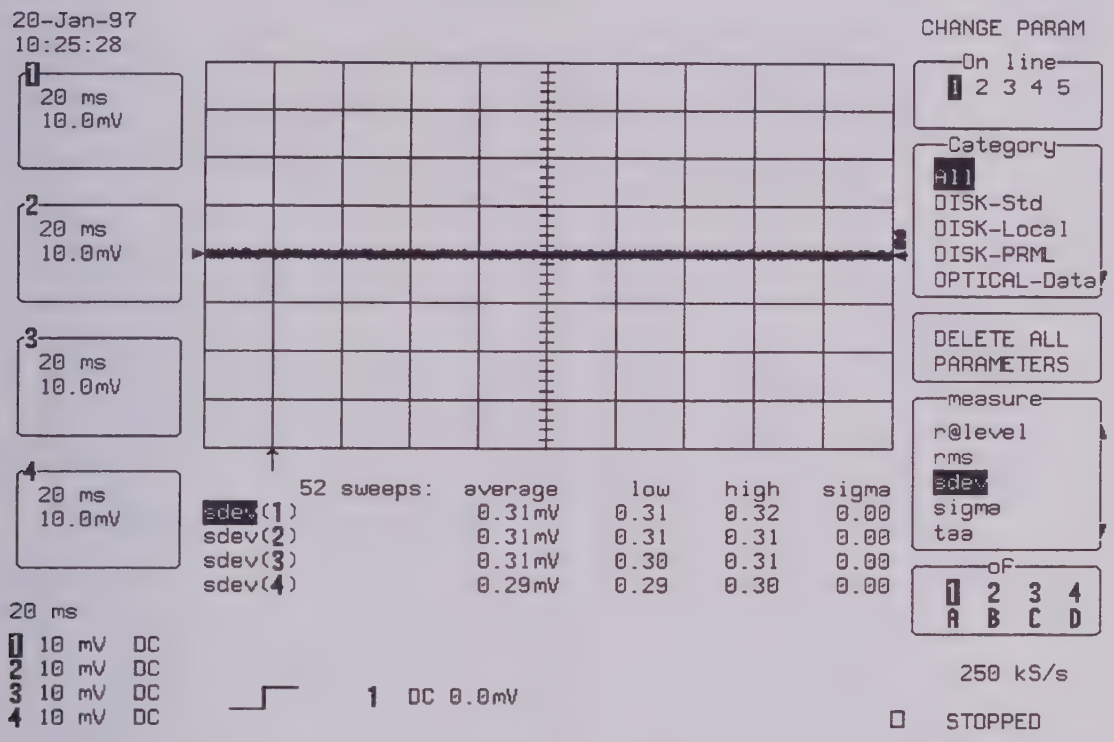
With no signal connected to the inputs

- Recall **574p021.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 1MΩ** on all 4 Channels
Input gain	:	**10 mV/div.** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**1**
Coupling 1	:	**DC**
Trigger Mode	:	**Auto**
Timebase	:	**20 msec/div.**
Channel use	:	**4**
Record up to	:	**50 k Samples**
Press	:	**Cursors/Measure**
Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**On**

Change parameters

Category	:	**All**
On line 1	:	**Measure sdev of Ch1**
On line 2	:	**Measure sdev of Ch2**
On line 3	:	**Measure sdev of Ch3**
On line 4	:	**Measure sdev of Ch4**
On line 5	:	**no parameter selected for line 5**



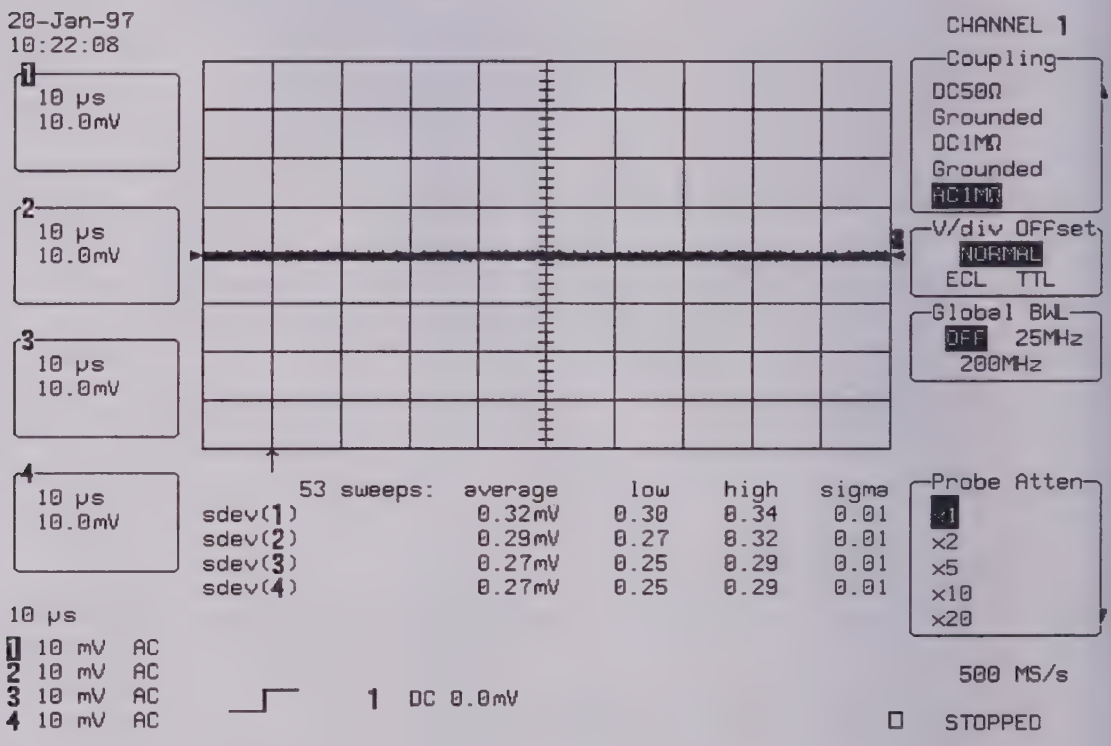
- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the four **high sdev** parameter values in Table 5, and compare the test results to the limits in the test record.
- Repeat the test for Timebase : **1 msec/div.**, **50 µsec/div.**, and **10 µsec/div.**
- Record the measurements (high sdev of 1,2,3,4) in Table 5, and compare the results to the limits in the test record.

b. AC 1MΩ

- Recall **574p022.PNL** or configure the DSO as shown in 5.6.2.a. and for each Channel make the following change :

  Input Coupling : **AC 1MΩ**

- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the four **high sdev** parameter values in Table 5, and compare the test results to the limits in the test record.



c. DC 50Ω

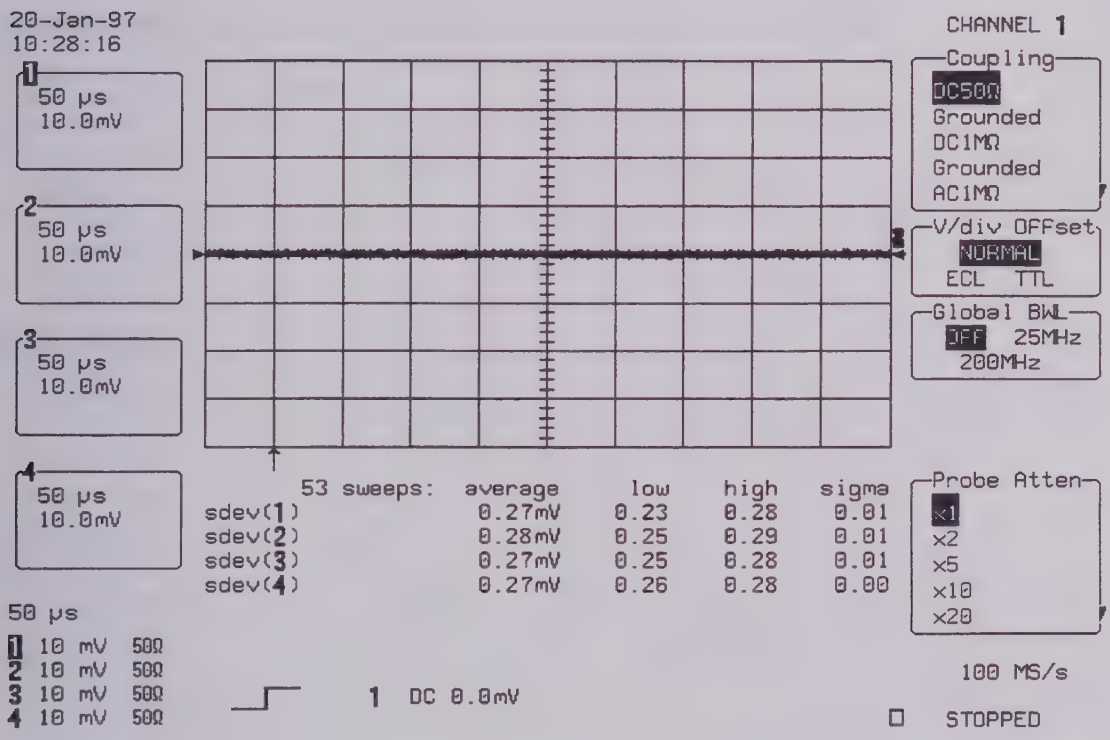
- Recall **574p023.PNL** or configure the DSO as shown in 5.6.2.a and make the following changes :

  Input Coupling : **DC 50Ω** on all 4 Channels

  Timebase : **10 µsec/div.**

- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the four **high sdev** parameter values in Table 5, and compare the test results to the limits in the test record.

- Repeat the test for Timebase : **50 µsec/div.**
- Record the measurements (high sdev of 1,2,3,4) in Table 5, and compare the results to the limits in the test record.



d. DC 50Ω, 2 Channel Mode

- Recall **574p024.PNL** or configure the DSO as shown in 5.6.2.a and make the following changes :

  Input Coupling : **DC 50Ω on all 4 Channels**

  Timebase : **5 µsec/div.**

  Select **Setup Timebase**

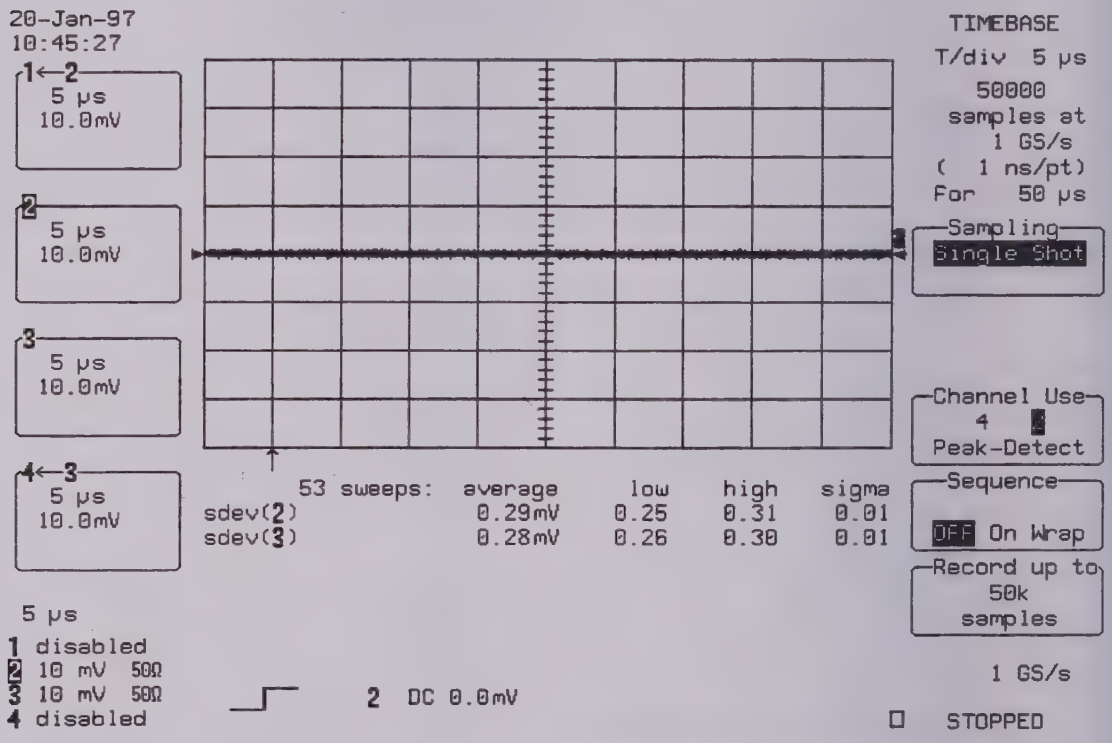
  Channel use : **2**

  Change parameters

  On line 1 : **Measure sdev of Ch2**

On line 2 : **Measure sdev of Ch3**

- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the two **high sdev** parameter values in Table 5, and compare the test results to the limits in the test record.



e. DC 50Ω, All Channels Combined

- Recall **574p025.PNL** or configure the DSO as shown in 5.6.2.a and make the following changes :

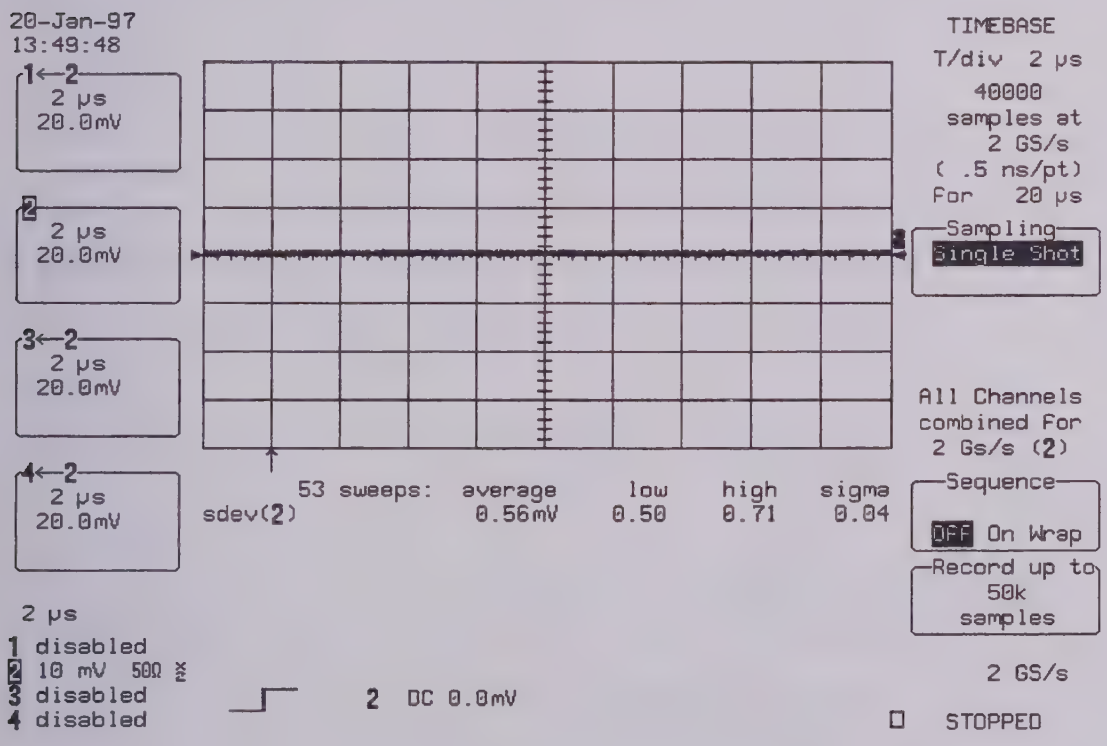
Input Coupling : **DC 50Ω** on all 4 Channels

Timebase : **2 µsec/div.**

Change parameters

On line 1 : **Measure sdev of Ch2**

- Connect a **PP094** adapter to Channel 2 and Channel 3
- Check :
- PP094 is identified on **Channel 2**
- Channel 1, Channel 3 and Channel 4 are **disabled**
- Sampling rate is **4 GS/s**



- Press **Clear Sweeps.**
- Measure for at least **50 sweeps**, then press **Stop** to halt the acquisition.
- Record the **high sdev** parameter value in Table 5, and compare the test result to the limits in the test record.
- Disconnect the **PP094** adapter.

5.6.3 Ground Line Test

Specifications

±5 % of full scale at 5 mV/div.
±2 % of full scale at 10 mV/div. and above.

Procedure

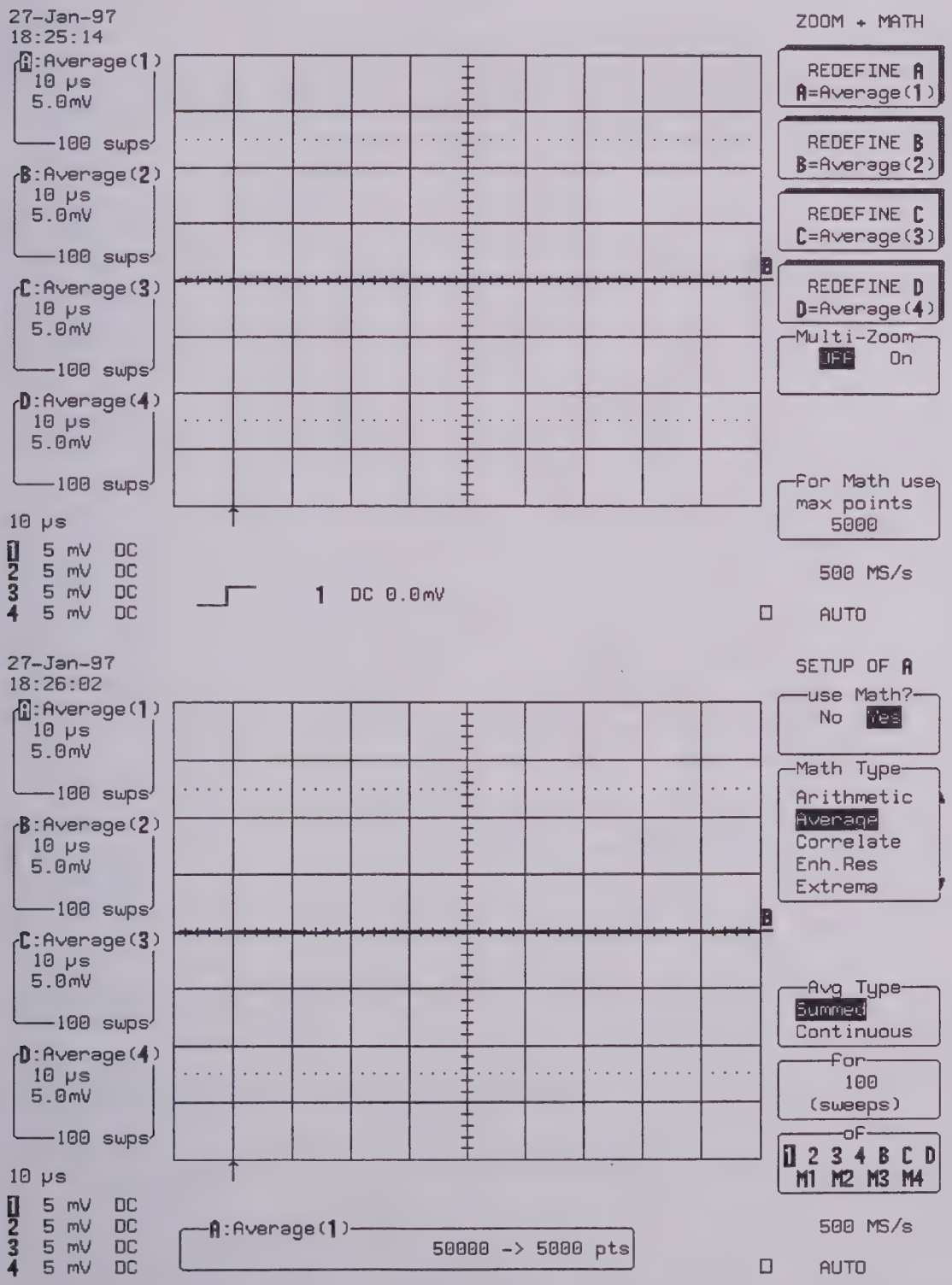
The stability of the ground line is verified for each channel at each fixed gain. The measured average values are checked against the desired limits.

a. DC 1MΩ

With no signal connected to the inputs

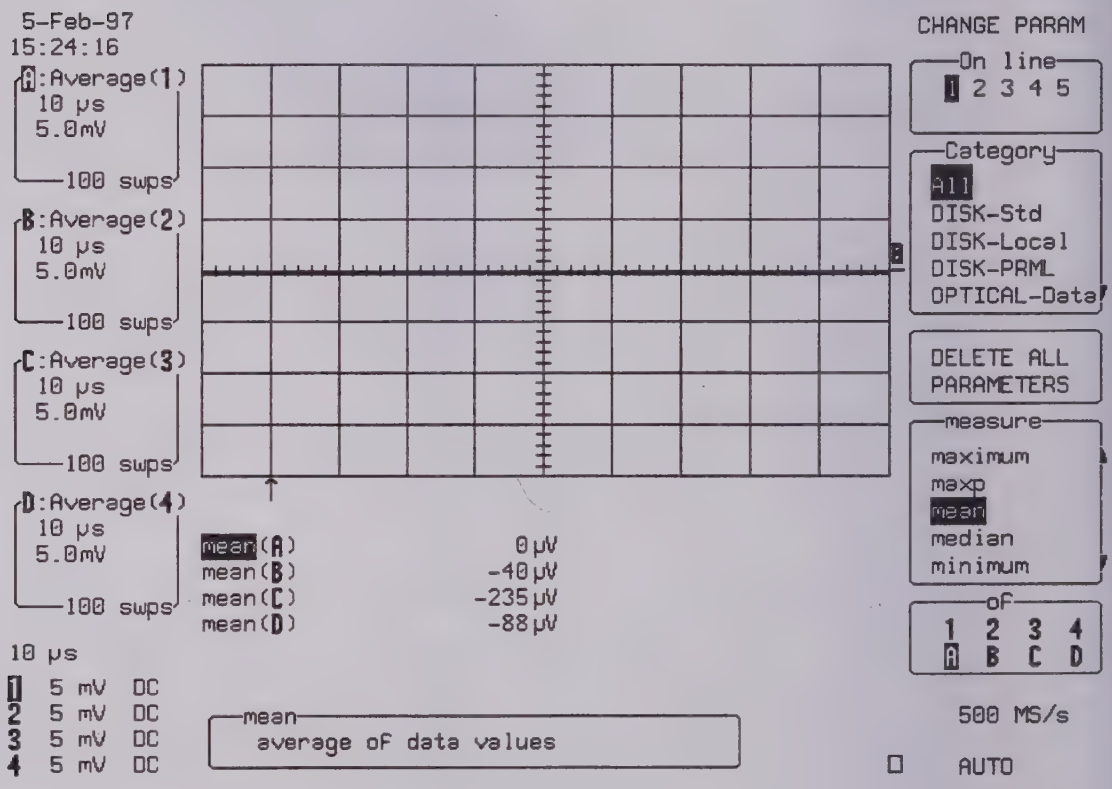
- Recall **574p026.PNL** or configure the DSO :

Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 1MΩ** on all 4 Channels
Input gain	:	**5 mV/div.** on all 4 Channels
Offset	:	**Zero** on all 4 Channels
Trigger on	:	**Channel 1, DC**
Trigger mode	:	**Auto**
Timebase	:	**10 µsec/div.**
Channel use	:	**4**
Record up	:	**50 k**
Channels Trace OFF		**Channel 1, Channel 2, Channel 3 & Channel 4**
Zoom+Math Trace ON		**A, B, C & D**
Select Math Setup		
For Math	:	**Use at most 5000 points**
Redefine A, B, C, D		**Channel 1, Channel 2, Channel 3 & Channel 4**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg. Type	:	**Summed**
For	:	**100 sweeps**
Press Cursors/Measure		
Select	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**off**



Change parameters

On line 1 : **Measure mean of A**
On line 2 : **Measure mean of B**
On line 3 : **Measure mean of C**
On line 4 : **Measure mean of D**

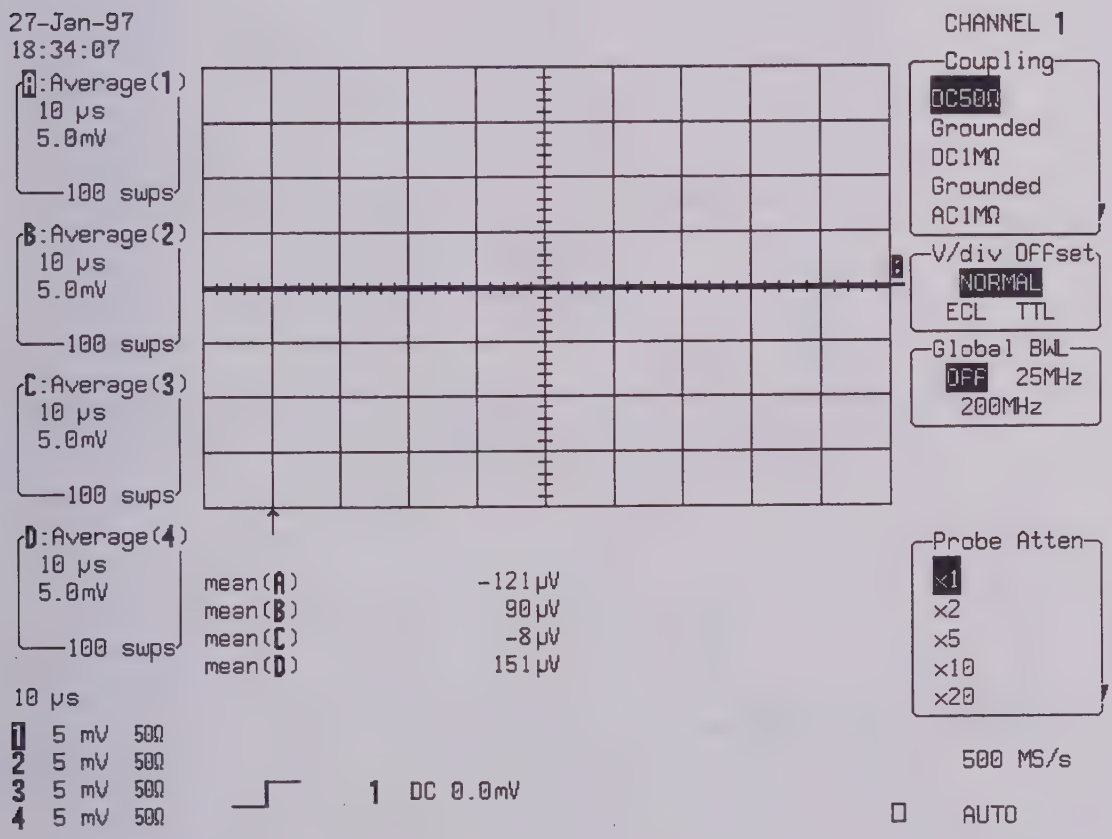


- Press **Clear Sweeps.**
- After **100 sweeps** record the **mean** value of **A, B, C & D** in Table 6, and compare the test results to the limits in the test record.
- Repeat step 5.6.3.a. for all vertical scale settings listed in Table 6, and check that the test results (mean value of A, B, C, D) are within the limits specified.
- Record the measurements in Table 6.

b. DC 50Ω

- Recall **574p027.PNL** or configure the DSO as shown in 5.6.3.a. and for each Channel make the following change :

  Input Coupling : **DC 50Ω**



- Press **Clear Sweeps.**
- After **100 sweeps** record the **mean** value of **A, B, C & D** in Table 7, and compare the test results to the limits in the test record.
- Repeat step 5.6.3.b. for all vertical scale settings listed in Table 7, and check that the test results (mean value of A, B, C, D) are within the limits specified.
- Record the measurements in Table 7.

c. DC 50Ω, 2 Channel Mode

- Recall **574p028.PNL** or configure the DSO as shown in 5.6.3.a. and make the following change :

  Input Coupling : **DC 50Ω** on all 4 Channels
  Input gain : **0.2 V/div.** on all 4 Channels
  Timebase : **5 µsec/div.**

  Select **Setup Timebase**

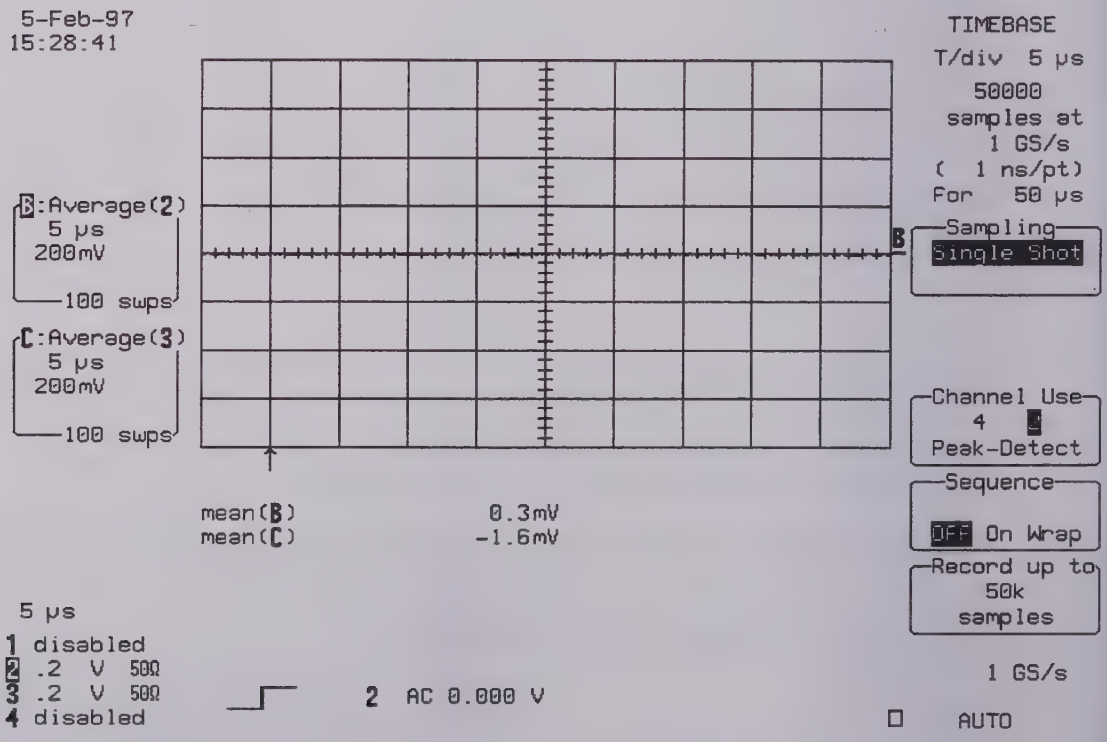
  Channel use : **2**

  Change parameters

  On line 1 : **Mean of B**
  On line 2 : **Mean of C**

- Press **Clear Sweeps.**

- After **100 sweeps** record the **mean** value of **B & C** in Table 7, and compare the test results to the limits in the test record.



d. DC 50Ω, All Channel Combined

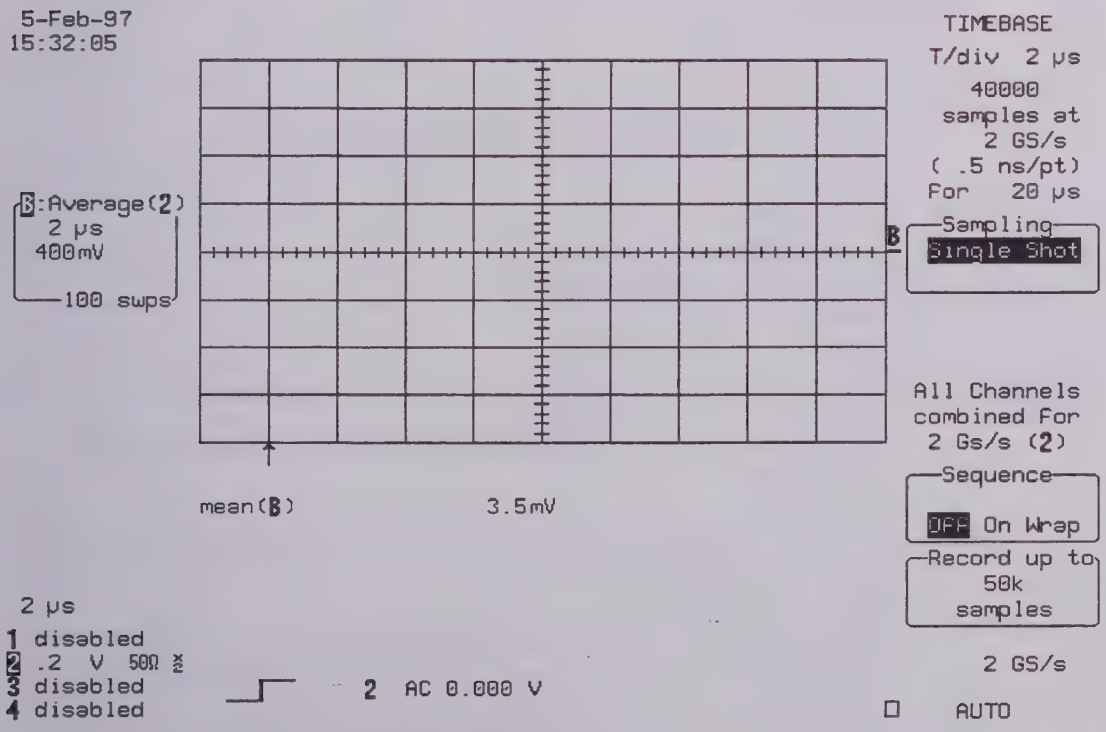
- Recall **574p029.PNL** or configure the DSO as shown in 5.6.3.a. and make the following changes :

Input Coupling	:	**DC 50Ω** on all 4 Channels
Input gain	:	**0.2 V/div.** on all 4 Channels
Timebase	:	**2 µsec/div.**
Change parameters		
On line 1	:	**Measure Mean of B**

- Connect a PP094 adapter to Channel 2 and Channel 3.
- Check :
- PP094 is identified on **Channel 2**
- Channel 1, Channel 3 and Channel 4 are **disabled**
- Sampling rate is **4 GS/s**

- Press **Clear Sweeps.**

- After **100 sweeps** record the **mean** value of **B** in Table 7, and compare the test result to the limits in the test record.



- Disconnect the **PP094** adapter.

5.7 DC Accuracy

Specification

≤ ±3 % of full scale at 5mV/div, with 0 mV offset.
≤ ±2 % of full scale at 10mV/div and above, with 0 mV offset.

Description

This test measures the DC Accuracy within the gain range specified.
It requires a DC source with a voltage range of 0 V to 20 V adjustable in steps of no more than 15 mV, and a calibrated DMM that can measure voltage to 0.1 %.
Measurements are made using voltage values applied by the external voltage reference source, measured by the DMM, and in the oscilloscope using the parameters Std voltage.
For each known input voltage, the deviation is checked against the tolerance.

5.7.1 Positive DC Accuracy

a. DC 50Ω

Procedure

- Recall **574p030.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 50Ω** on all 4 Channels
Input offset	:	**0.0 mV** on all 4 Channels
Input gain	:	from **5mV/div to 1 V/div.** (see Table 8) on all 4 Ch
Coupling 1	:	**DC**
Slope 1	:	**Pos.**
Mode	:	**Auto**
Holdoff	:	**Off**
Timebase	:	**2 msec/div**.
Channel use	:	**4**
Record up	:	**50 k**
Channels Trace OFF		**Channel 1, Channel 2, Channel 3 & Channel 4**
Zoom+Math Trace ON		**A, B, C & D**
Select Math Setup		
For Math	:	**Use at most 5000 points**
Redefine A, B, C, D		**Channel 1, Channel 2, Channel 3 & Channel 4**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg. Type	:	**Summed**
For	:	**100 sweeps**

Cursors/Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**off**

Change parameters

On line 1	:	**Measure mean of A**
On line 2	:	**Measure mean of B**
On line 3	:	**Measure mean of C**
On line 4	:	**Measure mean of D**

- For the low sensitivities : **5 mV, 10 mV and 20 mV/div**., connect the test equipment as shown in Figure 5-1.

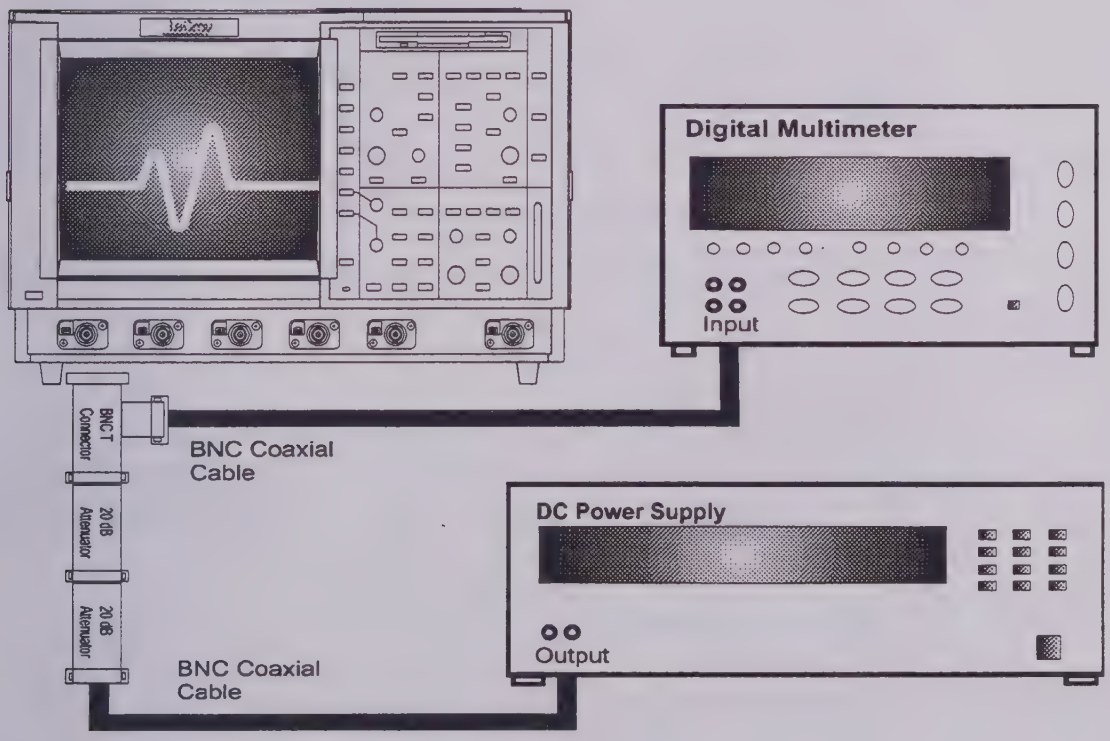


Figure 5-1 : DC 50Ω Accuracy Equipment Setup for 5, 10 and 20 mV/div

- For the sensitivities : 50 mV and 100 mV/div, connect the test equipment as shown in Figure 5-2.

- For the range 1 V/div no attenuator is required, connect the test equipment as shown in Figure 5-3.

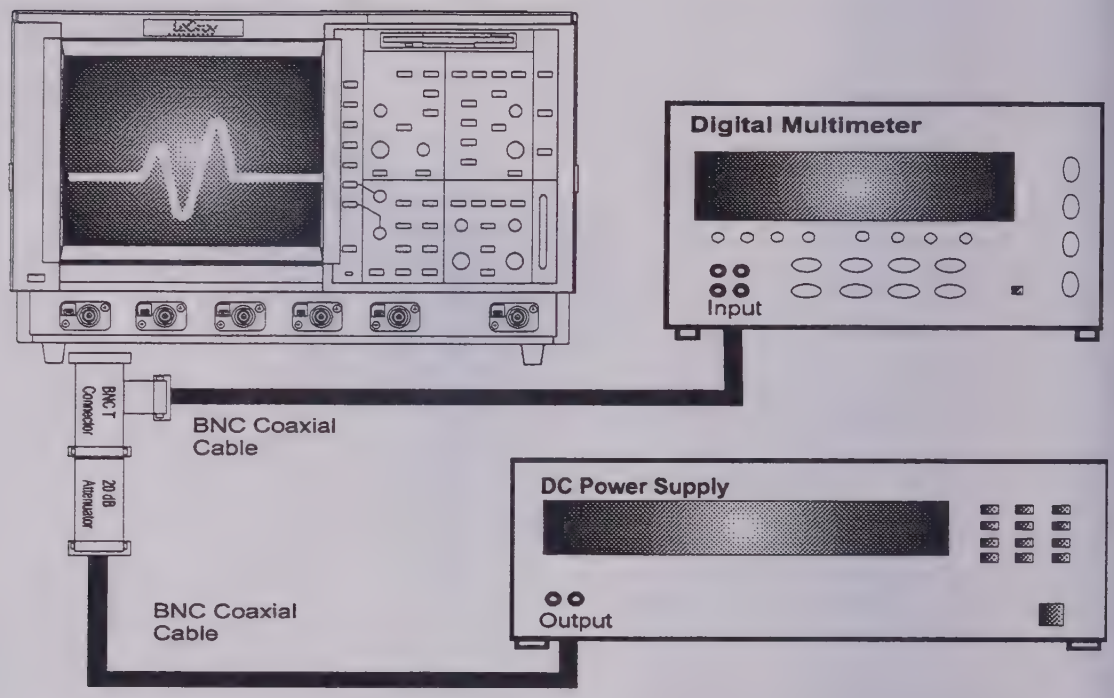


Figure 5-2 : DC 50Ω Accuracy Equipment Setup for 50 and 100 mV/div

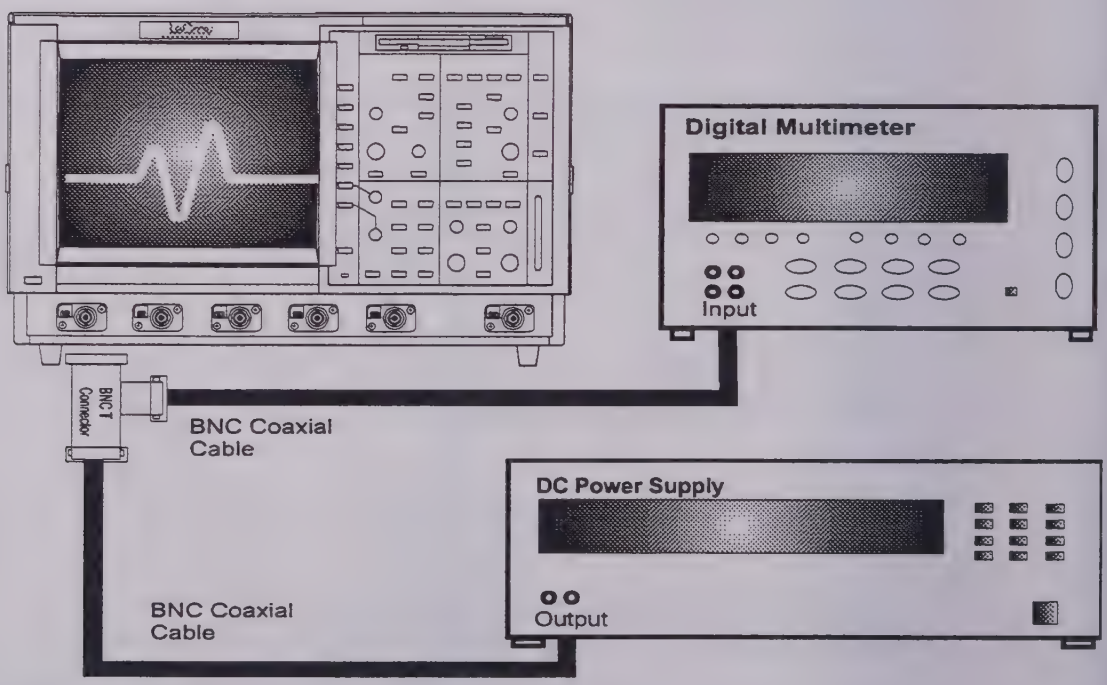


Figure 5-3 : DC 50Ω Accuracy Equipment Setup for 1 V/div.

- For each **DSO Volts/div**, set the output of the external **DC voltage reference source** as shown in Table 8, column PS output.

  1) Connect the DMM and record the **voltage reading** in Table 8, column **DMM.**

  2) Disconnect the DMM from the BNC T connector.

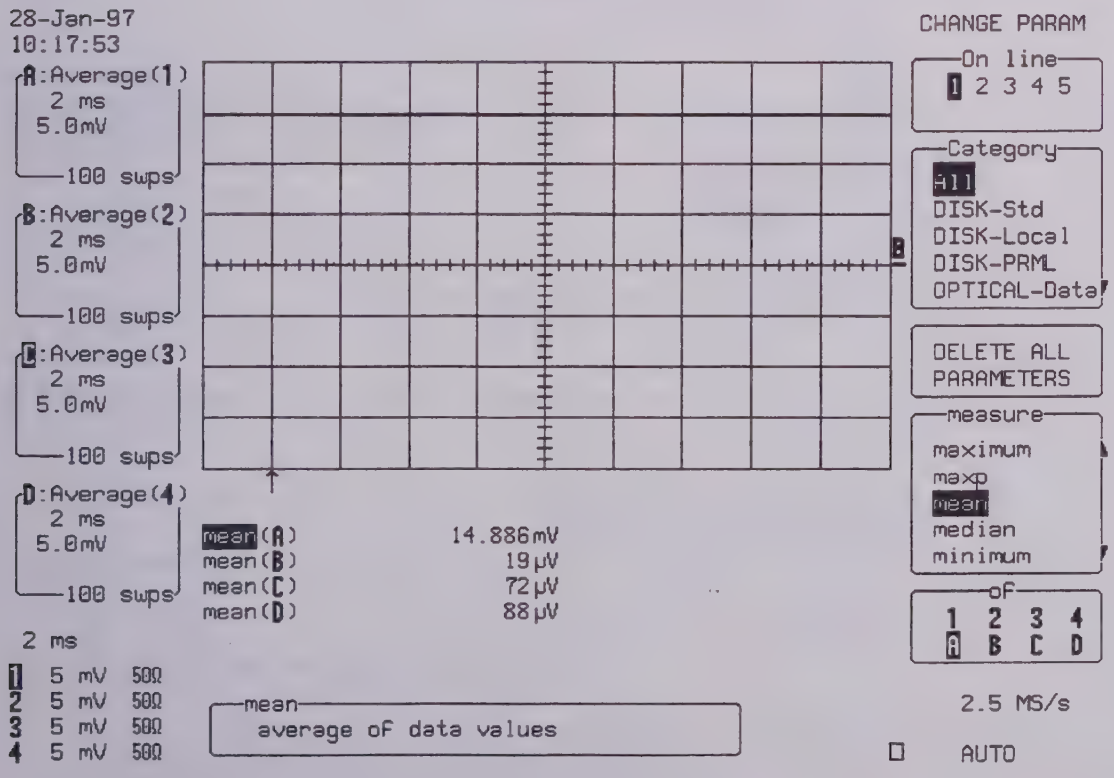
  3) Press **Clear Sweeps**

  4) After 100 sweeps, read off the **DSO mean parameter**, and record the measurement in Table 8, column **Mean**.

- For each DC voltage applied to the DSO input, repeat parts 1), 2), 3) and 4).

- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 8, and compare the **Difference (Δ)** to the corresponding limit in the test record.

- Repeat step 5.7.1.a. for the other channels, substituting channel controls and input connector.



b. DC 1MΩ

Procedure

- Recall **574p031.PNL** or configure the DSO as shown in 5.7.1.a. and make the following change :

  Input Coupling : **DC 1MΩ** on all 4 Channels

- For 5 mV/div., connect the test equipment as shown in Figure 5-4.

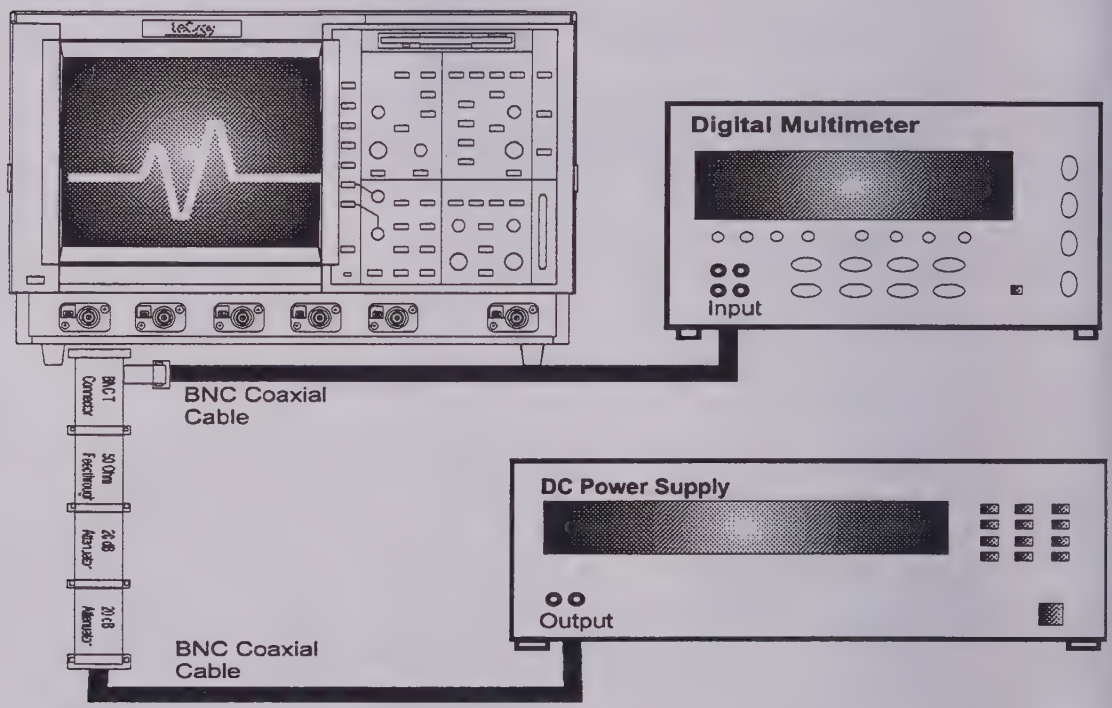


Figure 5-4: DC 1MΩ Accuracy Equipment Setup for 5 mV/div.

- For 100 mV/div, connect the test equipment as shown in Figure 5-5.
- For 5V/div no attenuator is required, connect the test equipment as shown in Figure 5-6.

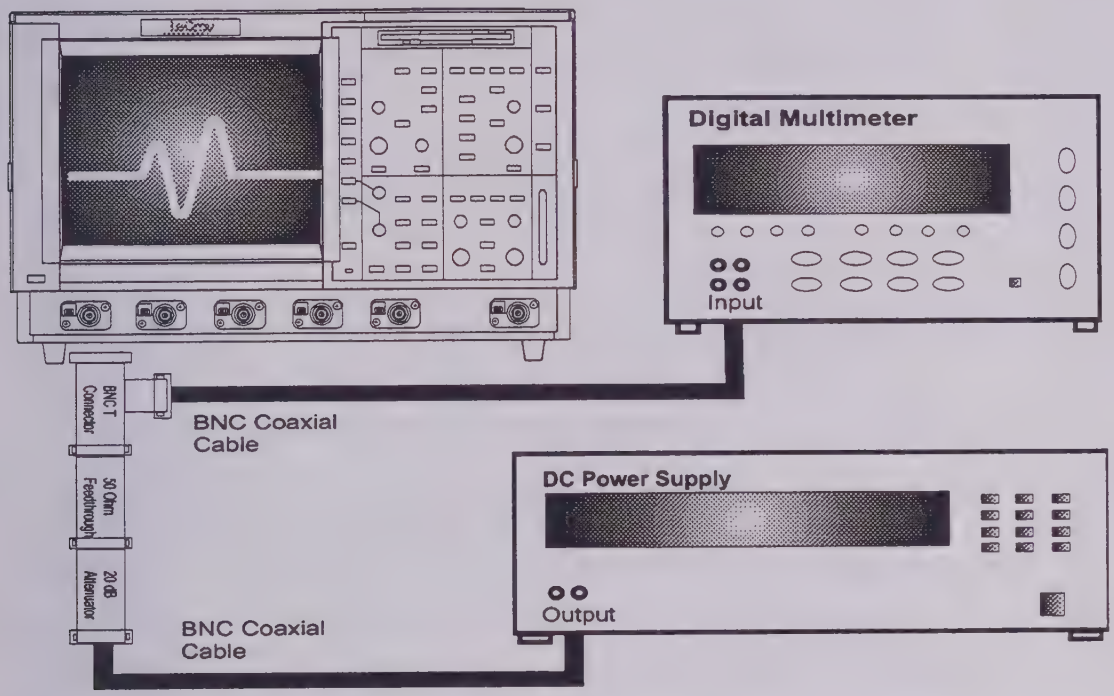


Figure 5-5 : DC 1MΩ Accuracy Equipment Setup for 100 mV/div

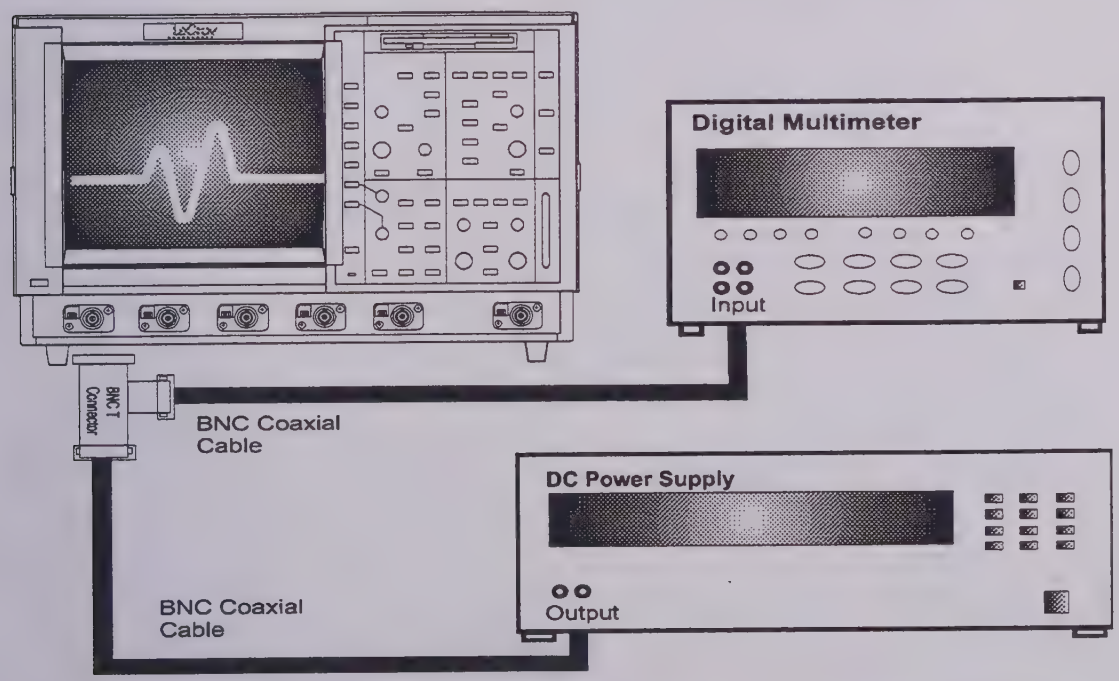


Figure 5-6 : DC 1MΩ Accuracy Equipment Setup for 5V/div.

- For each **DSO Volts/div**, set the output of the external **DC voltage reference source** as shown in Table 9, column PS output.

  1) Connect the DMM and record the **voltage reading** in Table 9, column **DMM.**

  2) Disconnect the DMM from the BNC T connector.

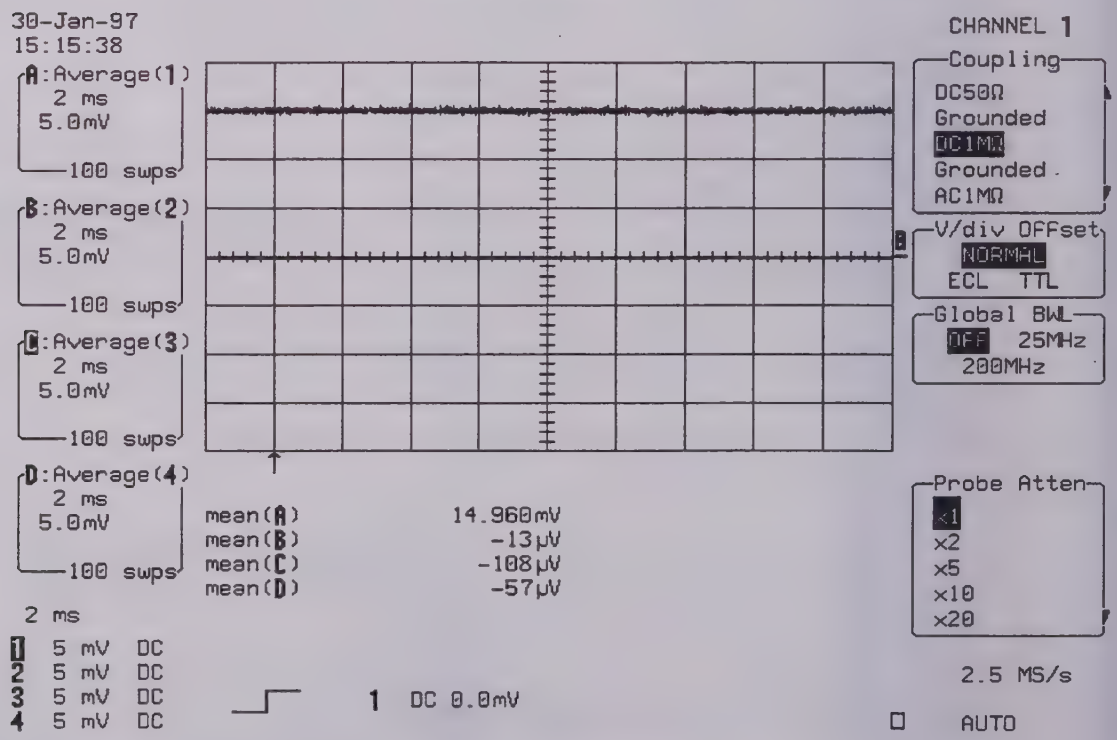
  3) Press **Clear Sweeps**

  4) After 100 sweeps, read off the **DSO mean parameter**, and record the measurement in Table 9, column **Mean**.

- For each DC voltage applied to the DSO input, repeat parts 1), 2), 3) and 4).

- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 9, and compare the **Difference (Δ)** to the corresponding limit in the test record.

- Repeat step 5.7.1.b. for the other channels, substituting channel controls and input connector.



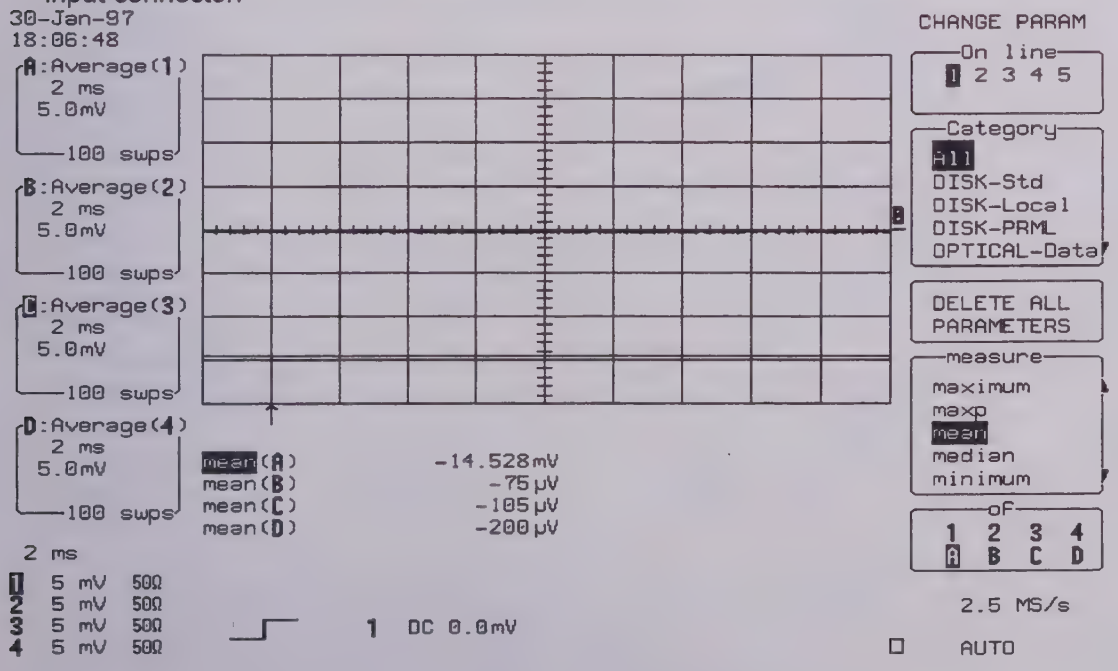
5.7.2 Negative DC Accuracy

a. DC 50Ω

- Recall **574p030.PNL** or configure the DSO as shown in 5.7.1.a.
- Connect the test equipment as shown in either Figure 5-1 or 5-2 or 5-3.
- For each **DSO Volts/div**, set the output of the external **DC voltage reference source** as shown in Table 10, column PS output. (if a banana-BNC adapter is being used it can simply be turned to get the opposite polarity)

  1) Connect the DMM and record the **voltage reading** in Table 10, column **DMM.**
  2) Disconnect the DMM from the BNC T connector.
  3) Press **Clear Sweeps**
  4) After 100 sweeps, read off the **DSO mean parameter**, and record the measurement in Table 10, column **Mean.**

- For each DC voltage applied to the DSO input, repeat parts 1), 2), 3) and 4).
- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 10, and compare the **Difference (Δ)** to the corresponding limit in the test record.
- Repeat step 5.7.2.a. for the other channels, substituting channel controls and input connector.



b. DC 1 MΩ

- Recall **574p031.PNL** or configure the DSO as shown in 5.7.1.a. and make the following change :

  Input Coupling : **DC 1 MΩ** on all 4 Channels

- Connect the test equipment as shown in either Figure 5-4 or 5-5 or 5-6.

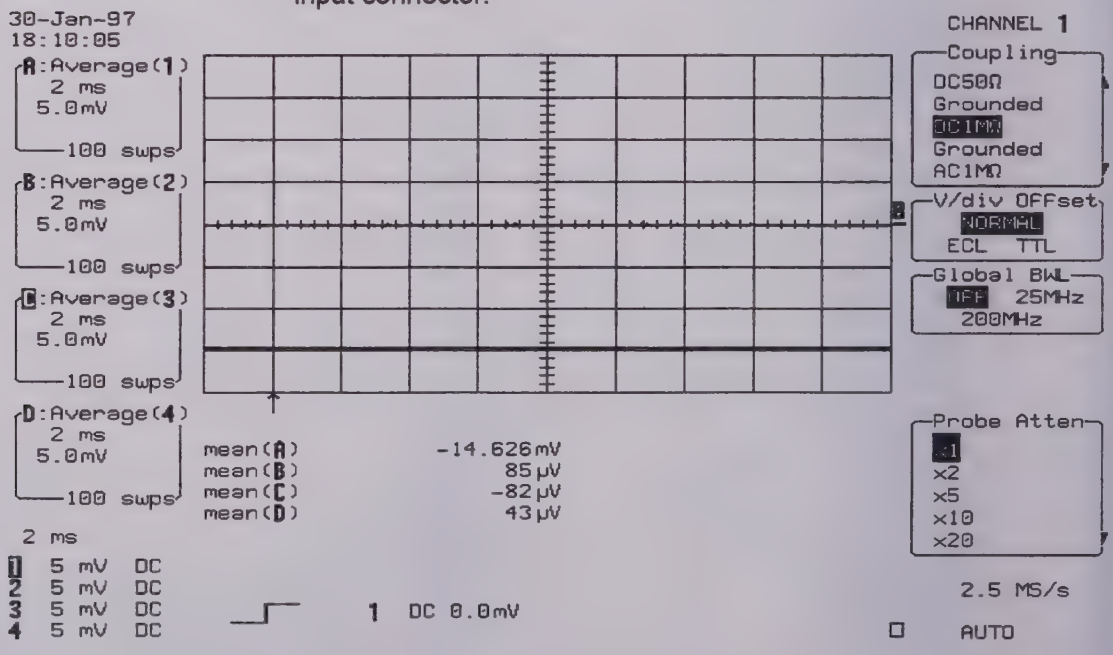
- For each **DSO Volts/div**, set the output of the external **DC voltage reference source** as shown in Table 11, column PS output.

  1) Connect the DMM and record the **voltage reading** in Table 11, column **DMM.**
  2) Disconnect the DMM from the BNC T connector.
  3) Press **Clear Sweeps**
  4) After 100 sweeps, read off the **DSO mean parameter**, and record the measurement in Table 11, column **Mean**.

- For each DC voltage applied to the DSO input, repeat parts 1), 2), 3) and 4).

- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 11, and compare the **Difference (Δ)** to the corresponding limit in the test record.

- Repeat step 5.7.2.b. for the other channels, substituting channel controls and input connector.



5.8 Offset Accuracy

Specifications

Offset range ±1 Volt at 5 mV/div
Accuracy ≤ ±11.2 mV (3 % of full scale +1 % of offset).

Description

The offset test is done at 5 mV/div, for 50Ω and 1MΩ couplings, with a signal of ±1 Volt cancelled by an offset of the other polarity.

5.8.1 Positive Offset Accuracy

a. DC 50Ω

Procedure

- Recall **574p032.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 50Ω** on all 4 Channels
Input gain	:	**5mV/div** on all 4 Channels
Input offset	:	**+1 Volt** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**1**
Coupling 1	:	**DC**
Slope 1	:	**Pos.**
Mode	:	**Auto**
Timebase	:	**2 msec/div**.
Channel use	:	**4**
Record up	:	**50 k**
Channels Trace OFF		**Channel 1, Channel 2, Channel 3 & Channel 4**
Zoom+Math Trace ON		**A, B, C & D**
Select Math Setup		
For Math	:	**Use at most 5000 points**
Redefine A, B, C, D		**Channel 1, Channel 2, Channel 3 & Channel 4**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg. Type	:	**Summed**
For	:	**100 sweeps**
Cursors/Measure	:	**Parameters**
Mode	:	**Custom**

Statistics	:	**off**
Change parameters		
On line 1	:	**Measure mean of A**
On line 2	:	**Measure mean of B**
On line 3	:	**Measure mean of C**
On line 4	:	**Measure mean of D**

- Connect the test equipment as shown in Figure 5-7.

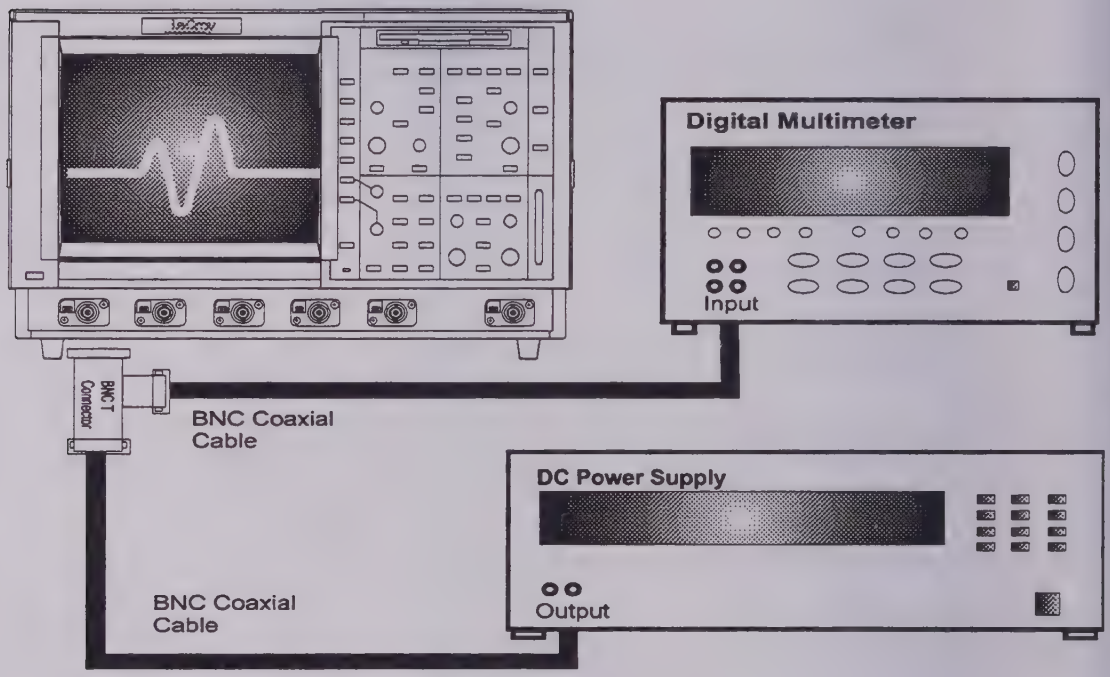
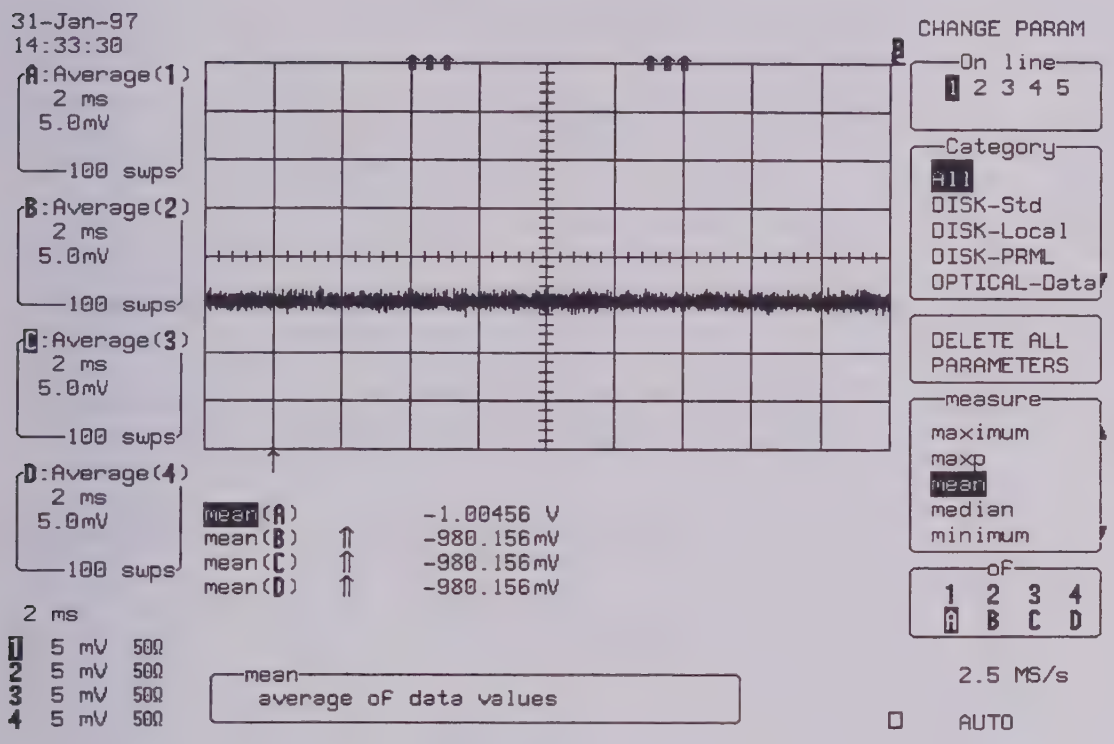


Figure 5-7 : Offset Accuracy Equipment Setup

- Set the output of the external **DC voltage reference source** to **–1 Volt**.
- Verify that the displayed trace A : Average (1) is in the screen, near to the center horizontal graticule line.
- Connect the DMM and record the **voltage reading** in Table 12, column **DMM**.
- Disconnect the DMM from the BNC T connector.
- Press **Clear Sweeps**
- After 100 sweeps, Read off the **DSO Mean parameter** voltage, and record the measurement in Table 12, column **Mean**.



- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 12, and compare the **Difference (Δ)** to the corresponding limit in the test record.

- Repeat the test for the other channels, substituting channel controls and input connector. Record the measurements in Table 12.

b. DC 1MΩ

Procedure

- Recall **574p033.PNL** or configure the DSO as shown in 5.8.1.a. and for each Channel make the following change :

  Input Coupling : **DC 1MΩ**

- Connect the test equipment as shown in Figure 5-7.

- Set the output of the external **DC voltage reference source** to **–1 Volt**.

- Verify that the displayed trace A : Average (1) is in the screen, near to the center horizontal graticule line.
- Connect the DMM and record the **voltage reading** in Table 12, column **DMM**.
- Disconnect the DMM from the BNC T connector.
- Press **Clear Sweeps**
- After 100 sweeps, Read off the **DSO Mean parameter** voltage, and record the measurement in Table 12, column **Mean**.
- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 12, and compare the **Difference (Δ)** to the corresponding limit in the test record.
- Repeat the test for the other channels, substituting channel controls and input connector. Record the measurements in Table 12.

5.8.2 Negative Offset Accuracy

a. DC 50Ω

Procedure

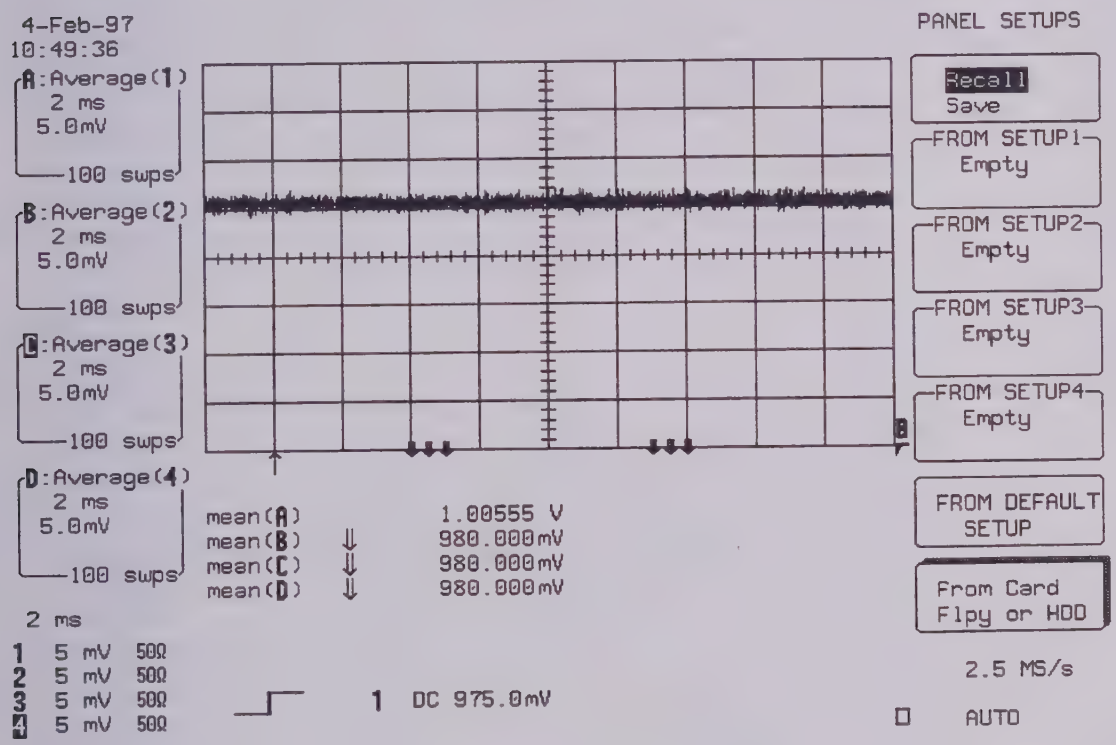
- Recall **574p034.PNL** or configure the DSO as shown in 5.8.1.a. and for each Channel make the following change :

  Input offset : **–1 Volt**

- Connect the test equipment as shown in Figure 5-7.
- Set the output of the external **DC voltage reference source** to **+1 Volt**.
- Verify that the displayed trace A : Average (1) is in the screen, near to the center horizontal graticule line.
- Connect the DMM and record the **voltage reading** in Table 13, column **DMM**.
- Disconnect the DMM from the BNC T connector.
- Press **Clear Sweeps**
- After 100 sweeps, Read off the **DSO Mean parameter** voltage, and record the measurement in Table 13, column **Mean**.

- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 13, and compare the **Difference (Δ)** to the corresponding limit in the test record.

- Repeat the test for the other channels, substituting channel controls and input connector. Record the measurements in Table 13.



b. DC 1MΩ

- Recall **574p035.PNL** or configure the DSO as shown in 5.8.1.a. and for each Channel make the following changes :

  Input Coupling : **DC 1MΩ**

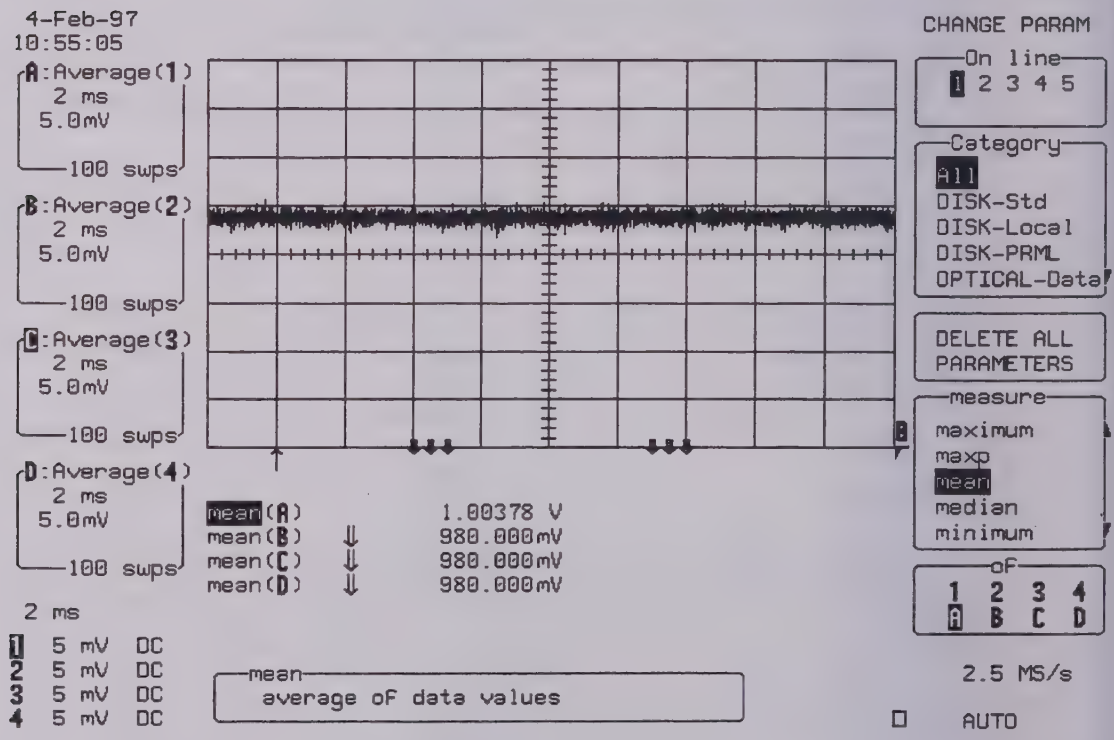
  Input offset : **–1 Volt**

- Connect the test equipment as shown in Figure 5-7.

- Set the output of the external **DC voltage reference source** to **+1 Volt**.

- Verify that the displayed trace A : Average (1) is in the screen, near to the center horizontal graticule line.

- Connect the DMM and record the **voltage reading** in Table 13, column **DMM**.
- Disconnect the DMM from the BNC T connector.
- Press **Clear Sweeps**
- After 100 sweeps, Read off the **DSO Mean parameter** voltage, and record the measurement in Table 13, column **Mean**.
- Calculate the **Difference (Δ)** by subtracting the **DMM voltage** reading from the **DSO mean** voltage reading. Record the test result in Table 13, and compare the **Difference (Δ)** to the corresponding limit in the test record.
- Repeat the test for the other channels, substituting channel controls and input connector. Record the measurements in Table 13.



5.9 Bandwidth

5.9.1 Description

The purpose of this test is to ensure that the entire system has a bandwidth of at least 1 GHz. An external source is used as the reference to provide a signal where amplitude and frequency are well controlled.
The amplitude of the generator as a function of frequency and power is calibrated using an HP8482A sensor on an HP436A power meter or equivalent.

Specifications

50Ω : DC to at least 1 GHz (–3 dB) at 10 mV/div. and above.

1MΩ : DC to 400 MHz typical at 100 mV/div

a. DC 50Ω

- Recall **574p036.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 50Ω** on all 4 Channels
Input gain	:	**50mV/div** on all 4 Channels
Input offset	:	**0 mV** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**Line**
Slope line	:	**Pos**
Mode	:	**Auto**
Timebase	:	**10 µsec/div.**
Channel use	:	**4**
Record up	:	**50 k**
Cursors/Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**On**
Change parameters		
On line 1	:	**Sdev of 1**
On line 2	:	**Sdev of 2**
On line 3	:	**Sdev of 3**
On line 4	:	**Sdev of 4**

- Connect the HP8482A power sensor to the power meter.

- Zero and **calibrate** the HP8482A power sensor using the power meter **Power Ref output**.

- Connect a **BNC adapter** to the HP8482A power sensor.
- Connect a 5ns 50 BNC cable to the **RF output** of the HP8648B generator and then through the necessary adapters to the power sensor.

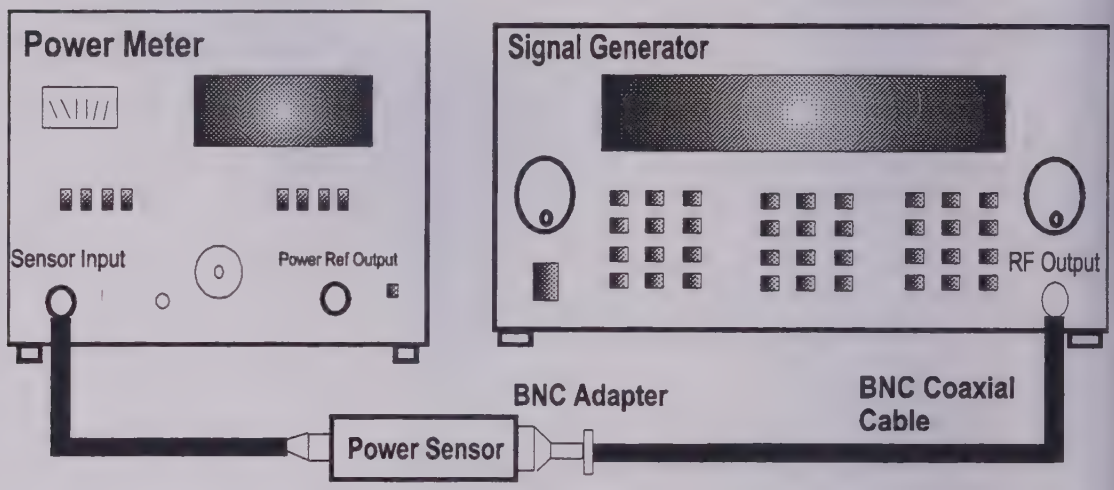


Figure 5-8 : Power Meter Equipment Setup

- Set the generator frequency to **300 KHz**
- Set the generator amplitude to measure **0.200 mW** on the power meter.
- Read the displayed **generator output amplitude,** and record it in the third column of Table 14.
- Repeat the above measurement for **1.1 MHz**, **30.1 MHz**, **250.1 MHz**, **750.1 MHz** & **1000.1 MHz**. Record the generator output amplitude readout in the third column of Table 14.
- Disconnect the **RF output** of the HP8648B generator from the HP8482A power sensor.
- Connect the **RF output** of the HP8648B generator through the 5ns 50 Ohm BNC cable into Channel 1.
- Set the generator frequency to **300 KHz**.
- From the generator, apply the **recorded generator signal amplitude** to Channel 1.
- Press **Clear Sweeps**.

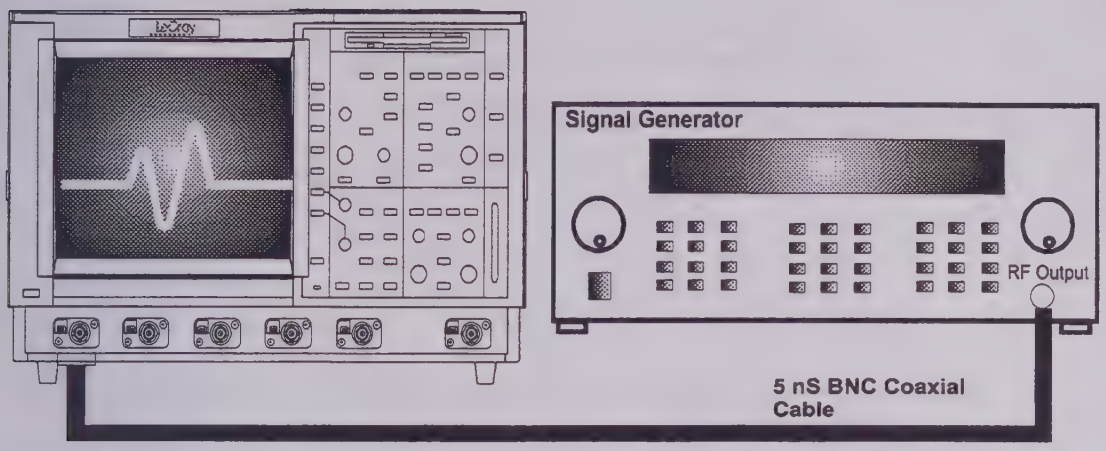


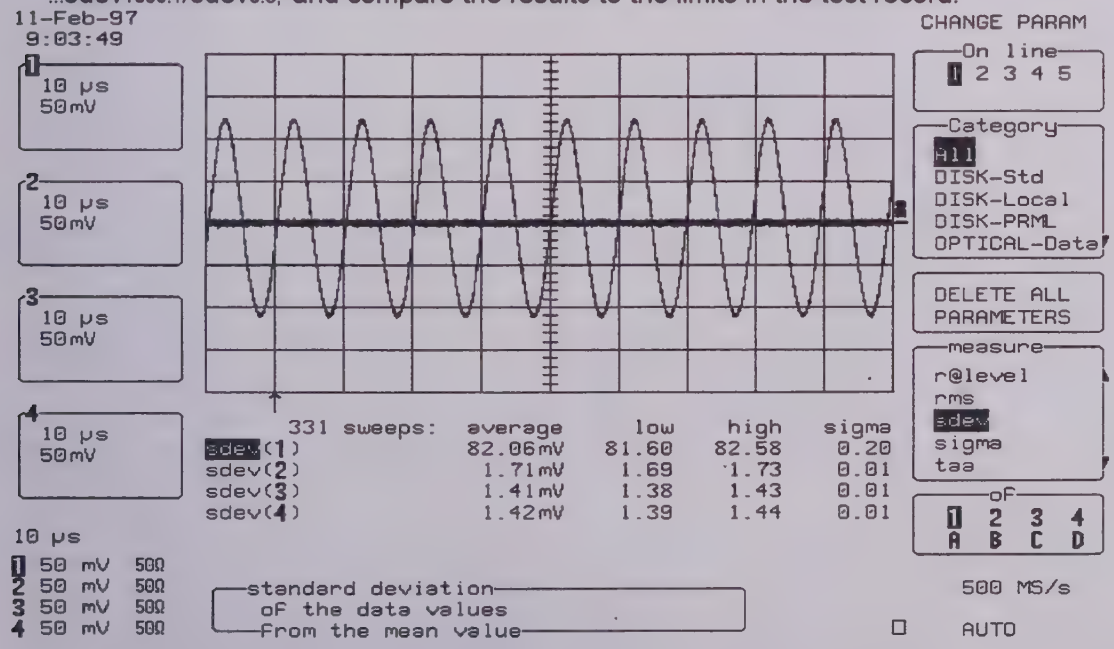
Figure 5-9 : 50Ω Bandwidth Equipment Setup

- Measure for at least 100 sweeps, record the average value of **sdev(1)** inTable14

- Repeat the above 3 steps for Channel 2, Channel 3 & Channel 4 substituting channel controls and input connector. Record the measurements in Table 14.

- Repeat the above measurement for all channels for 1.1 MHz, 30.1 MHz, 250.1 MHz, 750.1 MHz and 1000.1 MHz and record the values in Table 14.

- Calculate the ratio to .3 MHz for each frequency, $sdev_{1.1}/sdev_{0.3}$,$sdev_{30.1}/sdev_{0.3}$ ...$sdev_{1000.1}/sdev_{0.3}$, and compare the results to the limits in the test record.



- Recall **574p037.PNL** or configure the DSO as shown in 5.9.1.a. and for each Channel make the following change :

  Input gain : **100mV/div**

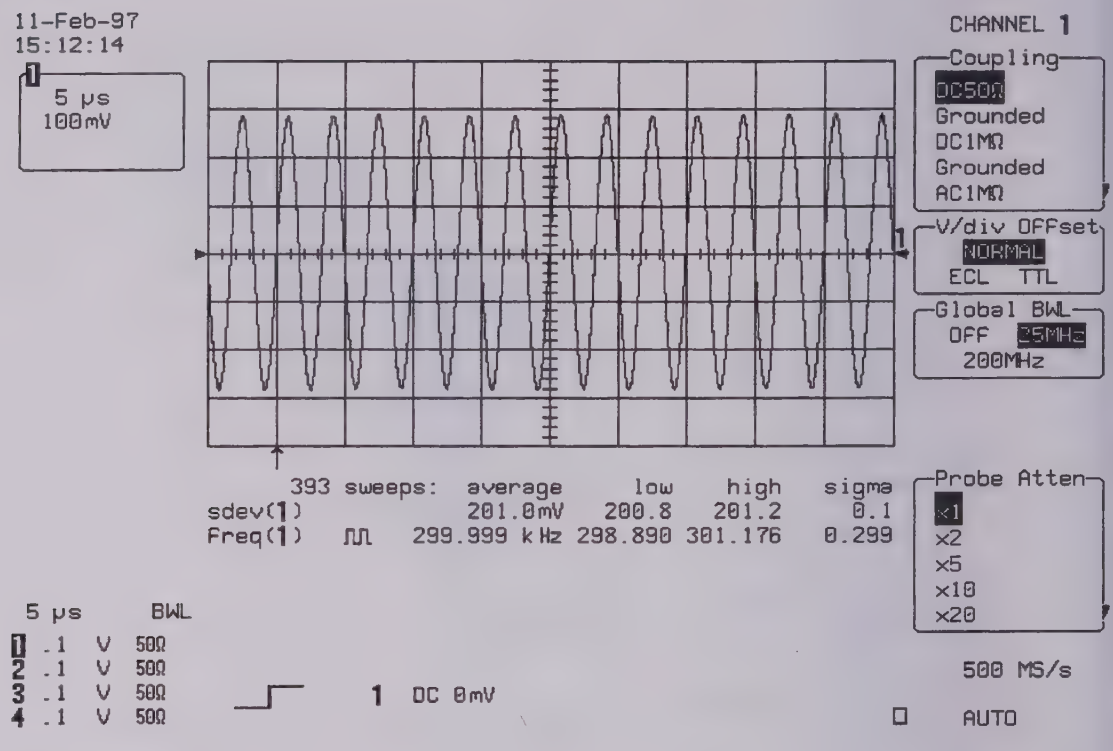
- Connect the test equipment as shown in Figure 5-8.
- Set the generator frequency to **300 kHz**
- Set the generator amplitude to measure **0.800 mW** on the power meter.
- Read the displayed **generator output amplitude,** and record it in the third column of Table 15.
- Repeat the above measurement for **1.1 MHz**, **30.1 MHz**, **250.1 MHz**, **750.1 MHz** & **1000.1 MHz**. Record the generator output amplitude readout in the third column of Table 15.
- Disconnect the **RF output** of the HP8648B generator from the HP8482A power sensor.
- Connect the test equipment as shown in Figure 5-9.
- Set the generator frequency to **300 kHz**.
- From the generator, apply the **recorded generator signal amplitude** to Channel 1.
- Press **Clear Sweeps**.
- Measure for at least 100 sweeps, record the average value of **sdev(1)** inTable15
- Repeat the above 3 steps for Channel 2, Channel 3 & Channel 4 substituting channel controls and input connector. Record the measurements in Table 15.
- Repeat the above measurement for all channels for 1.1 MHz, 30.1 MHz, 250.1 MHz, 750.1 MHz and 1000.1 MHz and record the values in Table 15.
- Calculate the ratio to .3 MHz for each frequency, $sdev_{1.1}/sdev_{0.3}$,$sdev_{30.1}/sdev_{0.3}$ ...$sdev_{1000.1}/sdev_{0.3}$, and compare the results to the limits in the test record.

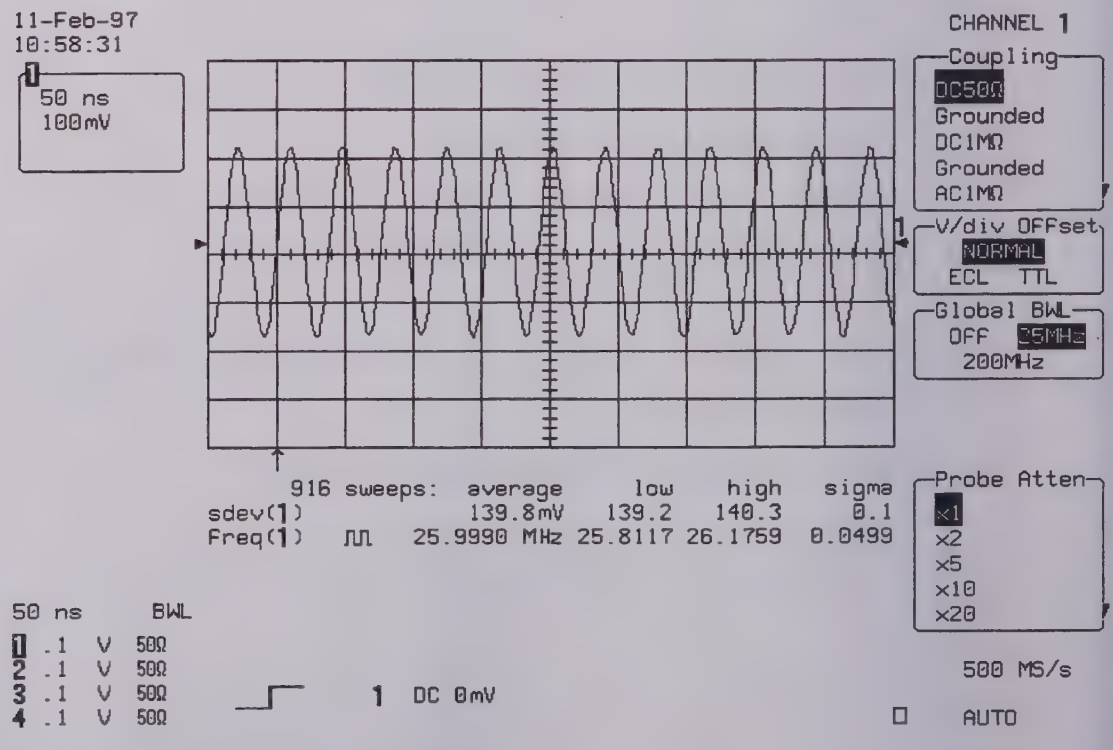
b. DC 50Ω with Bandwidth Limiter On

- Recall **574p038.PNL** or configure the DSO

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1**
Input Coupling	:	**DC 50Ω**
Global BWL	:	**25 MHz**
Input gain	:	**100 mV/div.**
Input offset	:	**0 mV**
Trigger setup	:	**Edge**
Trigger on	:	**1**
Slope line	:	**Pos**
Mode	:	**Auto**
Timebase	:	**5 µsec/div.**
Channel use	:	**4**
Record up	:	**50 k**
Cursors/Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**On**
Change parameters		
On line 1	:	**Sdev of 1**
On line 2	:	**Freq of 1**

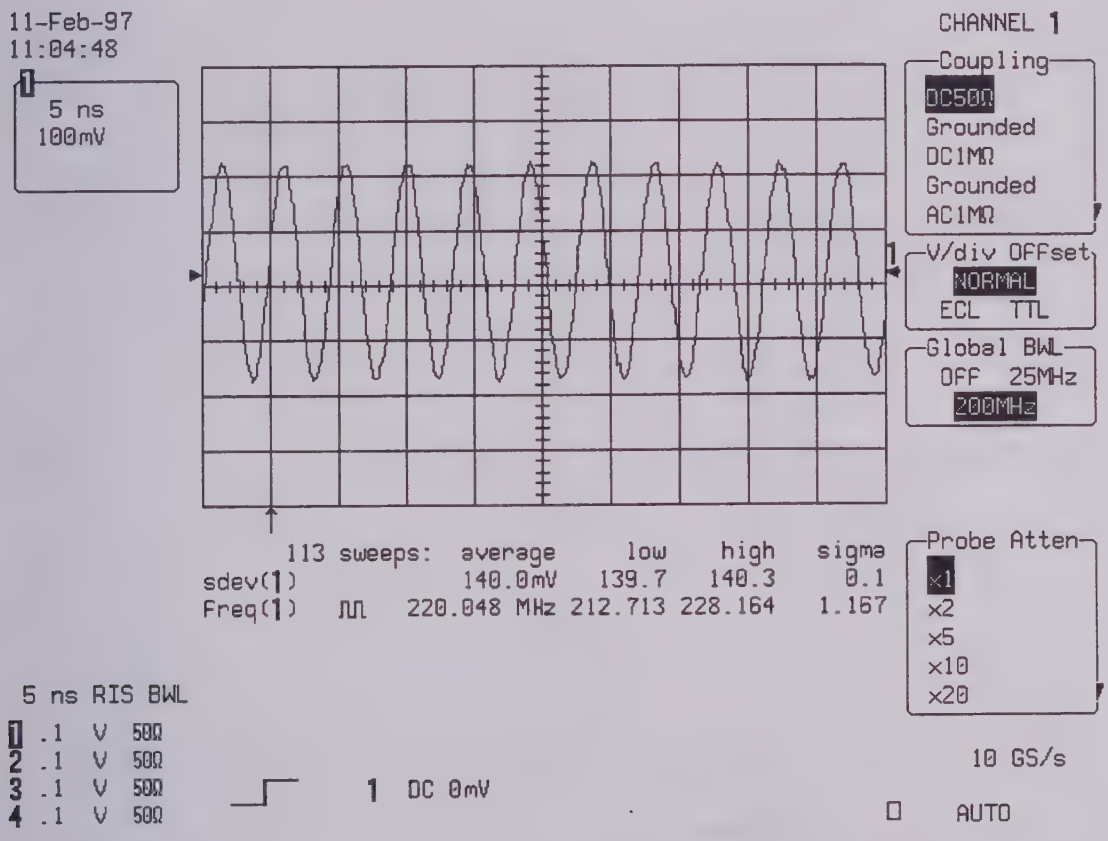
- Connect the test equipment as shown in Figure 5-9.
- Set the generator frequency to **300 kHz**.
- Adjust the generator signal amplitude to measure **sdev(1) = 200 mV.**
- Set Timebase : **50 nsec/div**.
- Increase the generator frequency until **sdev(1) = 140 mV.** (typically 25 MHz)
- Press **Clear Sweeps**
- When **sdev(1) = 140 mV,** record Freq(1) in Table 16.
- Check that the frequency is within the limits specified in Table 16.





- Set Global BWL : **200 MHz**

- Set Timebase : **5 nsec/div**.
- Increase the generator frequency until **sdev(1) = 140 mV.** (typically 200 MHz)



- Press **Clear Sweeps**
- When **sdev(1) = 140 mV,** record Freq(1) in Table 16.
- Repeat the 25 MHz and 200 MHz Bandwidth limiter tests for the other channels, substituting channel controls and input connector.
- Recall **574p039.PNL** for Channel 2, **574p040.PNL** for Channel3 **574p041.PNL** for Channel 4, or configure the DSO as shown in 5.9.1.b. and make the necessary changes.
- Record the test results in Table 16, and compare the results to the limits.

5.9.2 DC 1MΩ

- Recall **574p042.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 1MΩ** on all 4 Channels
Input gain	:	**100 mV/div.** on all 4 Channels
Input offset	:	**0 mV** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**Line**
Slope line	:	**Pos**
Mode	:	**Auto**
Timebase	:	**10 µsec/div.**
Channel use	:	**4**
Record up	:	**50 k**
Cursors/Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**On**
Change parameters		
On line 1	:	**Sdev of 1**
On line 2	:	**Sdev of 2**
On line 3	:	**Sdev of 3**
On line 4	:	**Sdev of 4**

- Connect the test equipment as shown in Figure 5-10.

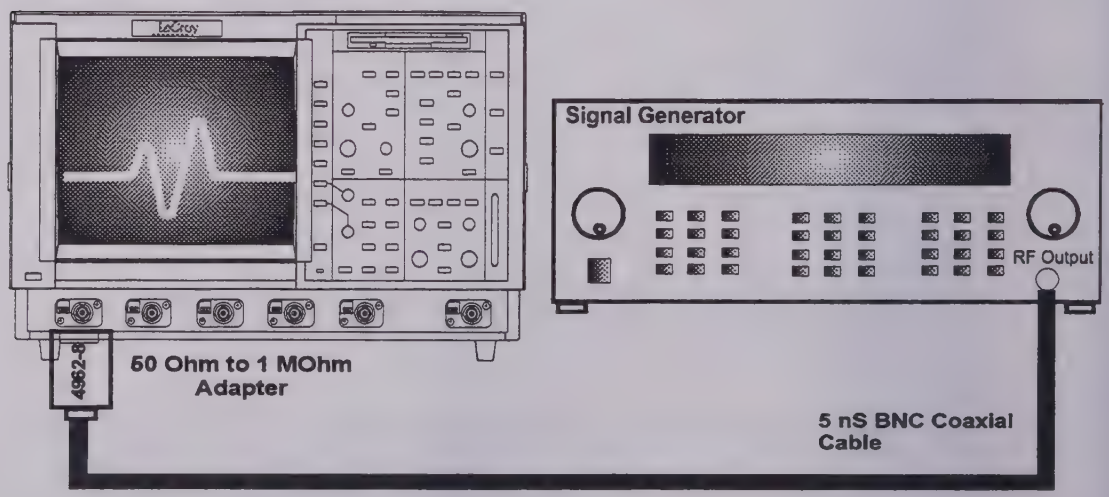
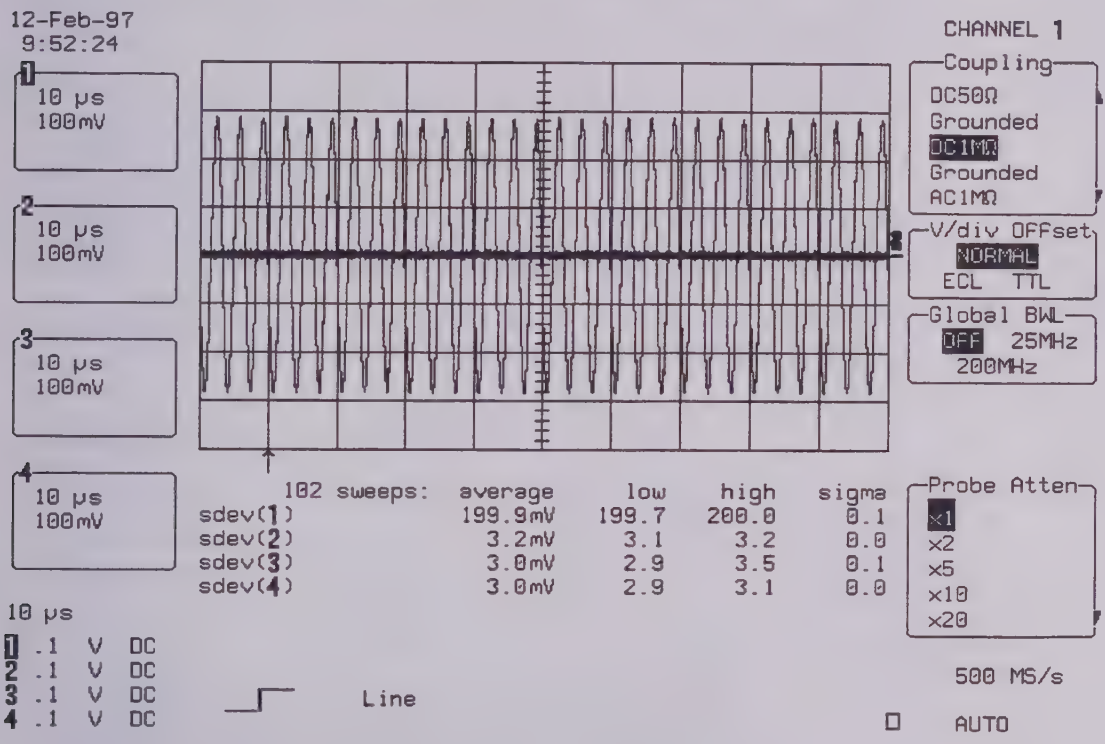


Figure 5-10 : 1MΩ Bandwidth Equipment Setup

- Set the generator frequency to **300 kHz**.
- Adjust the generator signal amplitude to measure **sdev(1) = 200 mV.**



- Disconnect the coaxial cable from the 4962-9 adapter. Connect the test equipment as shown in Figure 5-11.

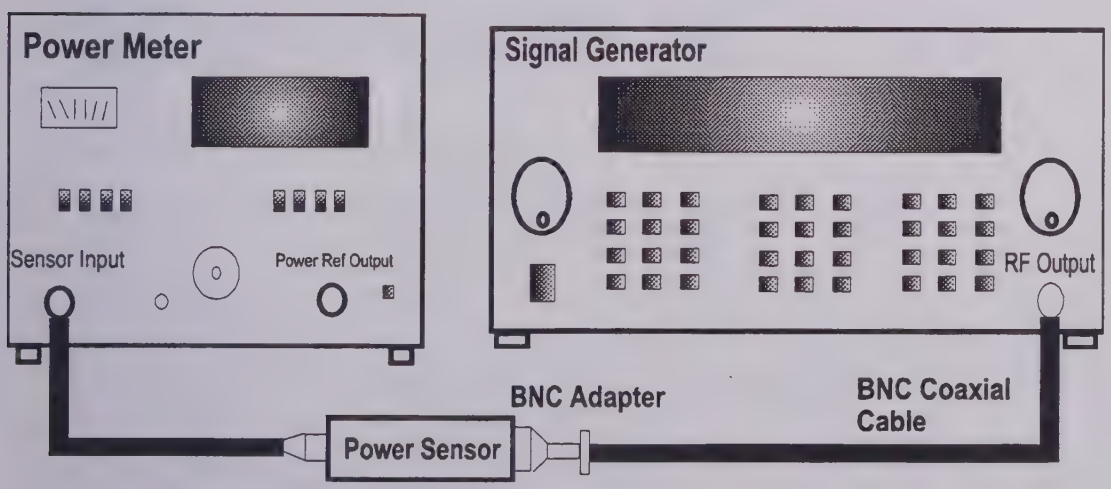
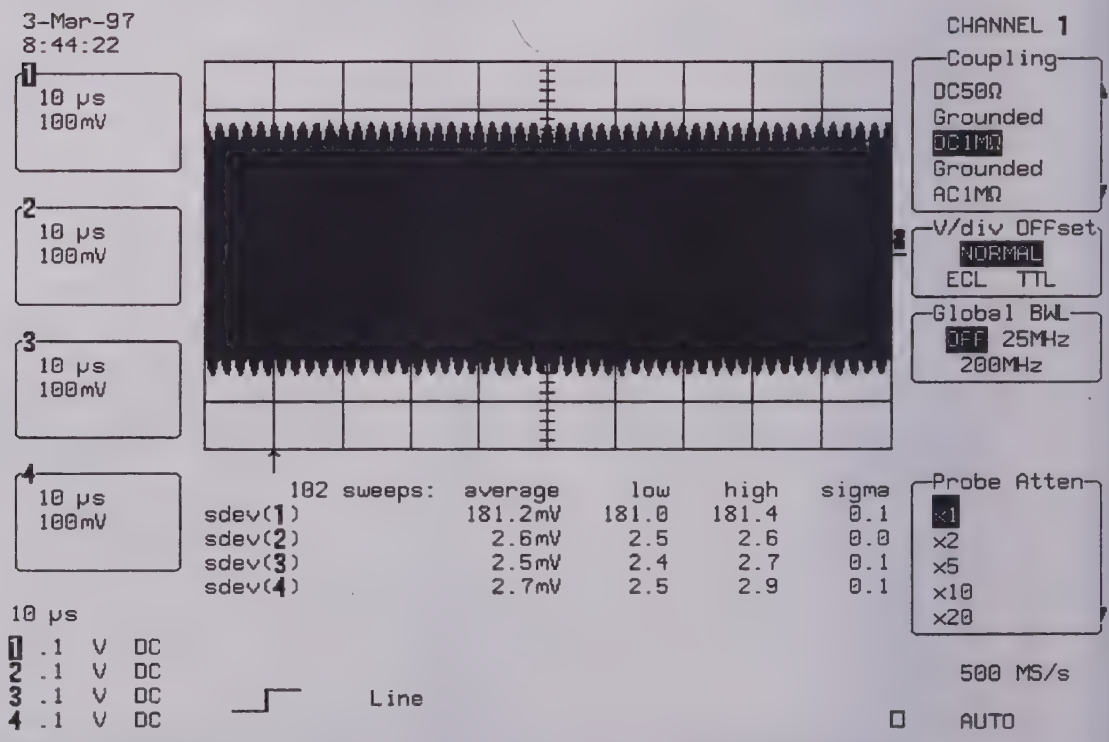


Figure 5-11 : Power Meter Equipment Setup

- Record the displayed power meter value in mW.

- Set the generator frequency to **400.1 MHz**.
- Now fine adjust the generator amplitude output until the power meter readout indicates the value measured just above at 300 kHz.
- Reconnect the signal generator to DSO Channel 1, as shown in Figure 5-10.
- Press **Clear Sweeps**.
- Measure for at least **100 sweeps**, record the average value of **sdev(1)** in Table17.
- Repeat the above steps for Channel 2, Channel 3 & Channel 4, substituting channel controls and input connector.
- Record the sdev measurements in Table17.
- Calculate the ratio **sdev400.1/sdev0.3** for each Channel, and test each value against the limits shown in the test record.



5.10 Trigger Level

5.10.1 Description

The trigger capabilities are tested for several cases of the standard edge trigger :

- Channel (internal), and External Trigger sources
- Three DC levels : –3, 0, +3 major screen divisions
- DC, HFREJ coupling
- Positive and negative slopes

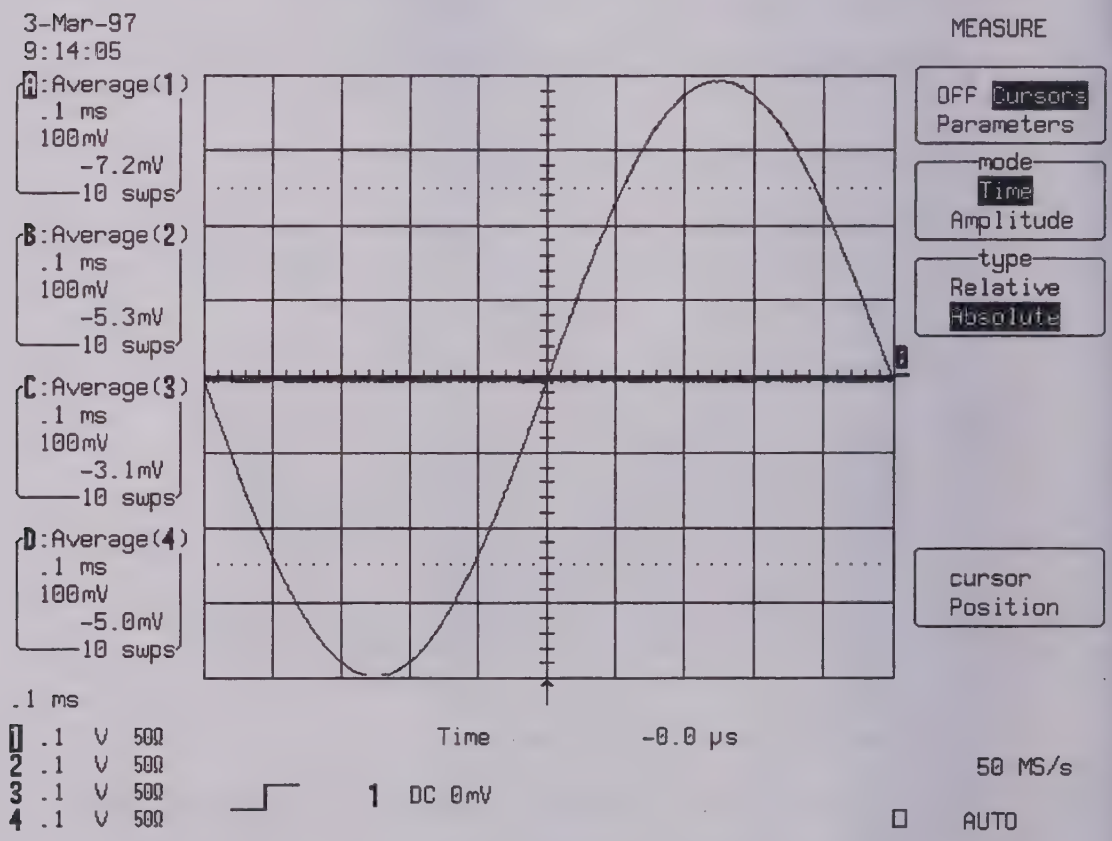
5.10.2 Channel Trigger at 0 Division Threshold

a. DC Coupling

Recall **574p043.PNL** or configure the DSO :

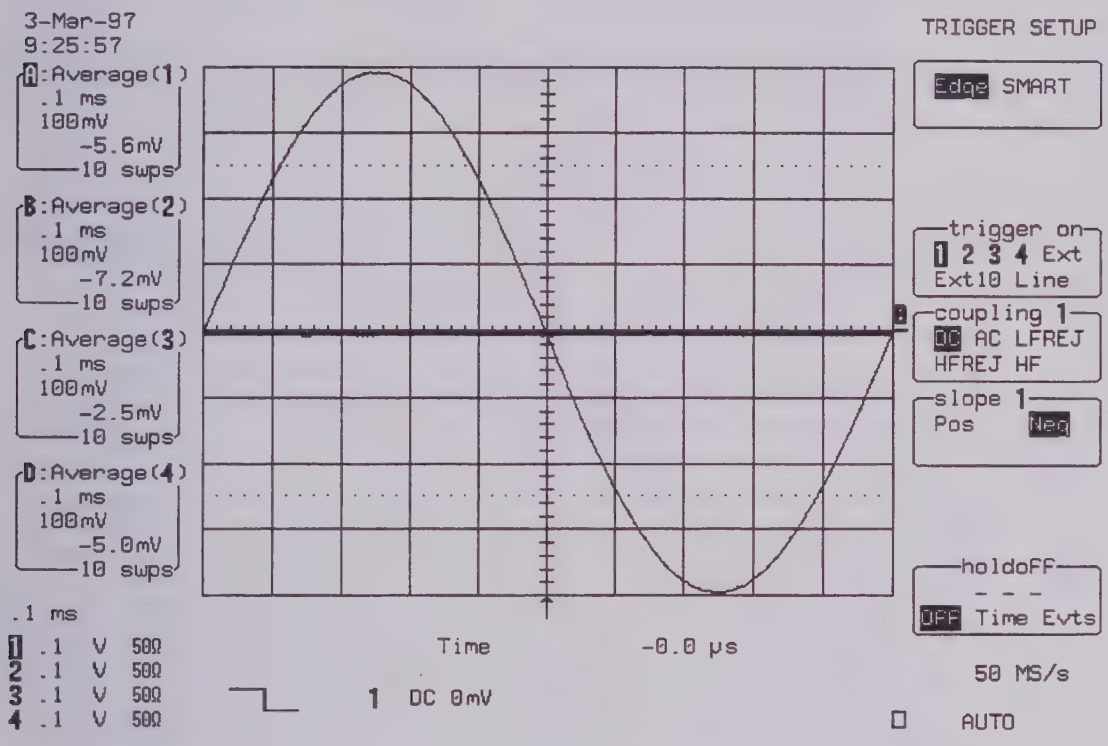
Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input Coupling	:	**DC 50Ω** on all 4 Channels
Input gain	:	**100 mV/div.** on all 4 Channels
Input offset	:	**0 mV** on all 4 Channels (use show status to verify)
Trigger setup	:	**Edge**
Trigger on	:	**1**
Slope 1	:	**Pos**
Coupling	:	**DC**
Mode	:	**Auto**
Set Trigger level	:	**DC 0.0 mV**
Pre-Trigger Delay	:	**50 %**
Timebase	:	**0.1 msec/div.**
Record up to	:	**50 k samples**
Channels Trace OFF		**Channel 1, Channel 2, Channel 3 & Channel 4**
Zoom+Math Trace ON		**A, B, C & D**
Select Math Setup		
For Math	:	**Use at most 5000 points**
Redefine A, B, C, D		**Channel 1, Channel 2, Channel 3 & Channel 4**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg. Type	:	**Summed**
For	:	**10 sweeps**

- Set the output of the LeCroy LW420 or equivalent audio frequency signal generator to **1 kHz.**
- Connect the output of the generator to Channel 1 through a 50 Ohm coaxial cable and adjust the sine wave output amplitude to get **8 divisions peak to peak .**
- Select Cursors/Measure : **Cursors, Time, Absolute**
- Use the "cursor position" knob, to move the **Time marker** at 0.0 µs



- Press **Clear Sweeps**,
- Acquire 10 sweeps and record in Table 18 the **level** readout displayed below 100 mV in the icon **1**, at top left.
- Compare the test results to the corresponding limit in the test record.
- Set Trigger Slope 1 : **Neg**

- Acquire 10 sweeps and record in Table 18 the **level** readout displayed below 100 mV in the icon **1,** at top left.



b. HFREJ Coupling

- Set Coupling : **HFREJ**

- Acquire 10 sweeps and record in Table 19 the **level** readout displayed below 100 mV in the icon **1,** at top left.

- Set Trigger Slope 1 : **Pos**

- Acquire 10 sweeps and record in Table 19 the **level** readout displayed below 100 mV in the icon **1,** at top left.

- Repeat steps 5.10.2.a. and 5.10.2.b. for all input channels, substituting channel controls (DC, HFREJ, Pos, Neg) and input connector.
  Recall **574p044.PNL** for Channel 2, **574p045.PNL** for Channel 3, **574p046.PNL** for Channel 4, or select **Trigger on** the Channel under test.
  The **Trigger level** is displayed in either the icon **2**, **3** or **4**

- Record the measurements in Table 18 & 19 and compare the test results to the corresponding limits in the test record.

5.10.3 Channel Trigger at +3 Divisions Threshold

a. DC Coupling

- Recall **574p047.PNL** or configure the DSO as shown in 5.10.2.a and for each Channel make the following change :

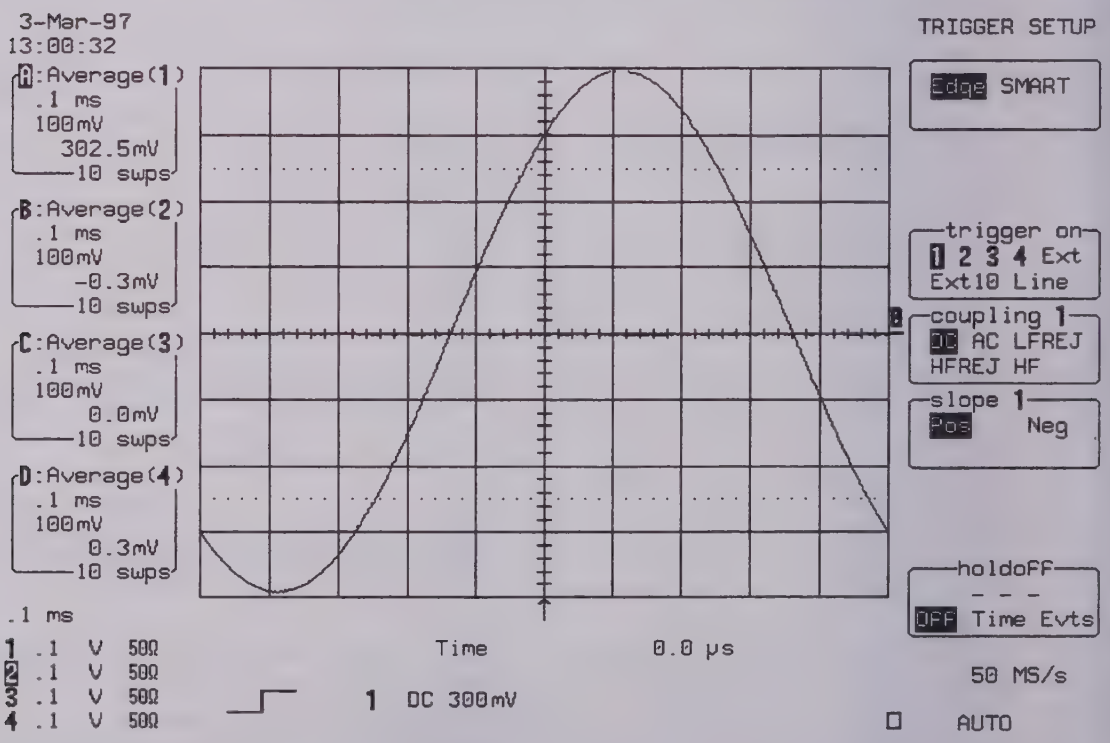
  Set Trigger level : **DC +300 mV**

- Connect the output of the generator to Channel 1 through a 50 Ohm coaxial cable.

- Press **Clear Sweeps**,

- Acquire 10 sweeps and record in Table 18 the **level** readout displayed below 100 mV in the icon **1**, at top left.

- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope 1 : **Neg**

- Acquire 10 sweeps and record in Table 18 the **level** readout displayed below 100 mV in the icon **1**, at top left.

b. HFREJ Coupling

- Set Coupling : **HFREJ**
- Acquire 10 sweeps and record in Table 19 the **level** readout displayed below 100 mV in the icon **1**, at top left.

- Set Trigger Slope 1 : **Pos**
- Acquire 10 sweeps and record in Table 19 the **level** readout displayed below 100 mV in the icon **1**, at top left.
- Repeat steps 5.10.3.a. and 5.10.3.b. for all input channels, substituting channel controls (DC, HFREJ, Pos, Neg) and input connector.
  Recall **574p048.PNL** for Channel 2, **574p049.PNL** for Channel 3, **574p050.PNL** for Channel 4, or select **Trigger on** the Channel under test.
  The **Trigger level** is displayed in either the icon **2**, **3** or **4**
- Record the measurements in Table 18 & 19 and compare the test results to the corresponding limits in the test record.

5.10.4 Channel Trigger at –3 Divisions Threshold

a. DC Coupling

- Recall **574p051.PNL** or configure the DSO as shown in 5.10.2.a and for each channel make the following change :

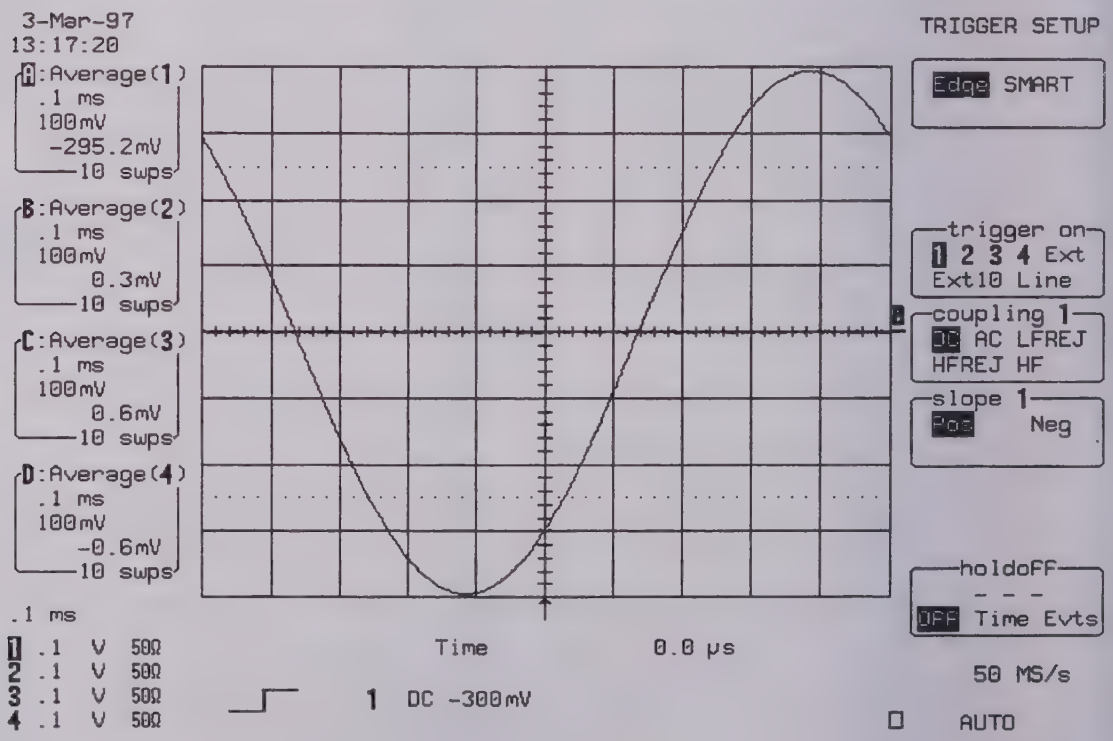
  Set Trigger level : **DC –300 mV**

- Connect the output of the generator to Channel 1 through a 50 Ohm coaxial cable.

- Press **Clear Sweeps**,

- Acquire 10 sweeps and record in Table 18 the **level** readout displayed below 100 mV in the icon **1**, at top left.

- Compare the test results to the corresponding limit in the test record.

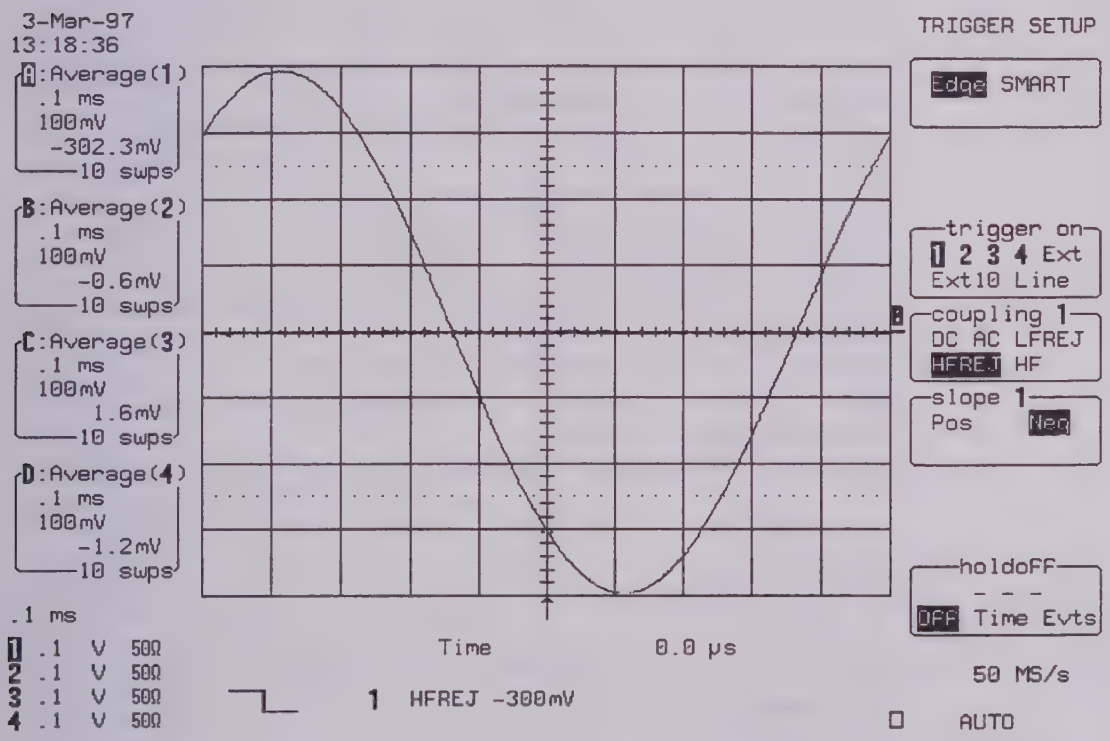


- Set Trigger Slope 1 : **Neg**

- Acquire 10 sweeps and record in Table 18 the **level** readout displayed below 100 mV in the icon **1**, at top left.

b. HFREJ Coupling

- Set Coupling : **HFREJ**
- Acquire 10 sweeps and record in Table 19 the **level** readout displayed below 100 mV in the icon **1**, at top left.



- Set Trigger Slope 1 : **Pos**
- Acquire 10 sweeps and record in Table 19 the **level** readout displayed below 100 mV in the icon **1**, at top left.
- Repeat steps 5.10.4.a. and 5.10.4.b. for all input channels, substituting channel controls (DC, HFREJ, Pos, Neg) and input connector.
  Recall **574p052.PNL** for Channel 2, **574p053.PNL** for Channel 3, **574p054.PNL** for Channel 4, or select **Trigger on** the Channel under test.
  The **Trigger level** is displayed in either the icon **2**, **3** or **4**
- Record the measurements in Table 18 & 19 and compare the test results to the corresponding limits in the test record.

5.10.5 External Trigger at 0 Division Threshold

a. DC Coupling

- Recall **574p055.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channel Trace ON		**Channel 2**
Input Coupling	:	**DC 50Ω**
Input gain	:	**100 mV/div.**
Input offset	:	**0 mV**
Trigger setup	:	**Edge**
Trigger on	:	**Ext**
Slope Ext	:	**Pos**
Coupling Ext	:	**DC**
Set Trigger level	:	**0.0 mV**
External	:	**DC 1MΩ**
Mode	:	**Auto**
Pre-Trigger Delay	:	**50 %**
Timebase	:	**0.1 msec/div.**
Record up to	:	**50 k samples**
Channel Trace OFF		**Channel 2**
Zoom+Math Trace ON		**B**
Select Math Setup		
For Math	:	**Use at most 5000 points**
Redefine B	:	**Channel 2**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg. Type	:	**Summed**
For	:	**10 sweeps**

- Connect the test equipment as shown in Figure 5-12.
- Set the output of the LeCroy LW420 or equivalent audio frequency signal generator to **1 kHz.**
- Adjust the sine wave output amplitude to get **8 divisions peak to peak .**
- Select Cursors/Measure : **Cursors, Time, Absolute**
- Use the "cursor position" knob, to move the **Time marker** at 0.0 μs

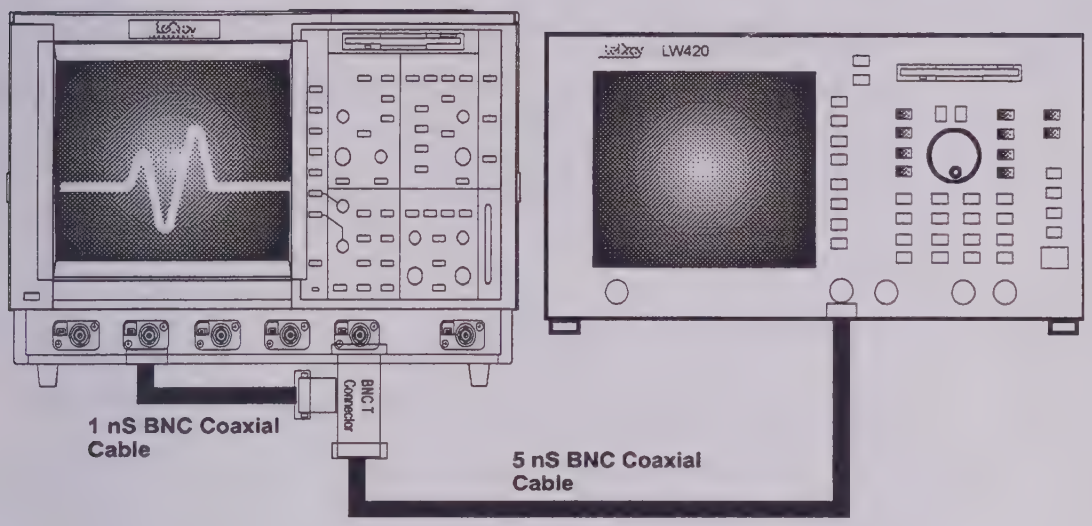
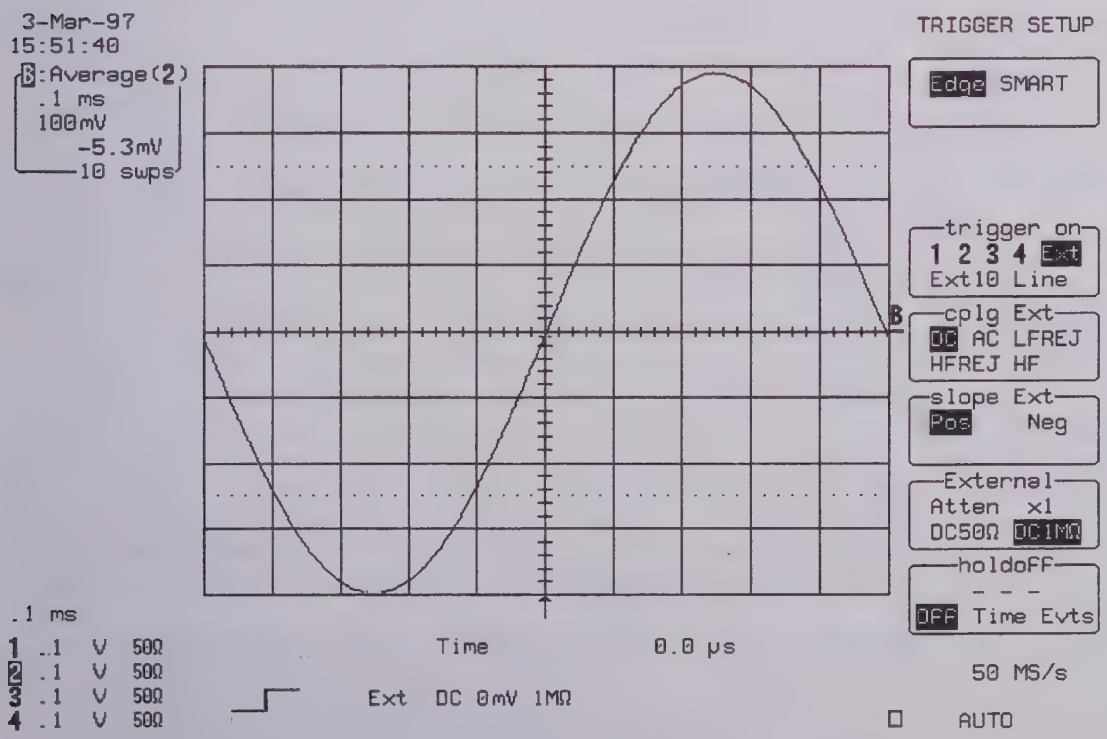


Figure 5-12 : External Trigger Equipment Setup

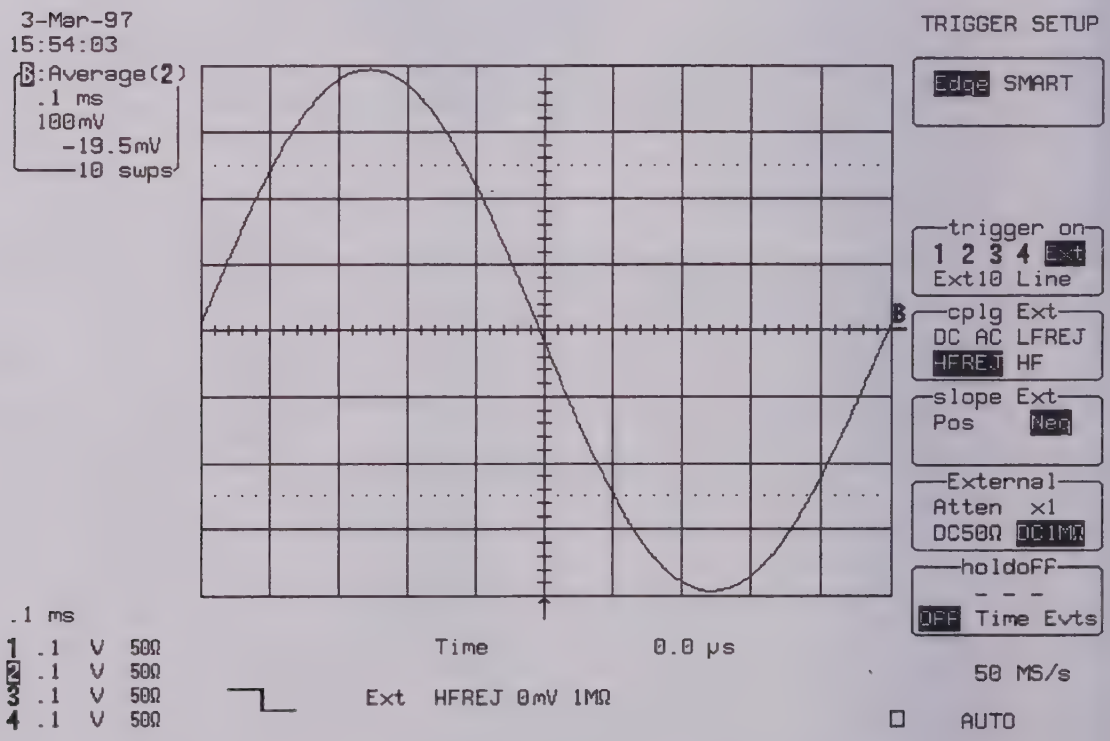
- Press **Clear Sweeps**,
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.



- Set Trigger Slope Ext : **Neg**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.

b. HFREJ Coupling

- Set Coupling Ext : **HFREJ**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.



- Set Trigger Slope Ext : **Pos**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.

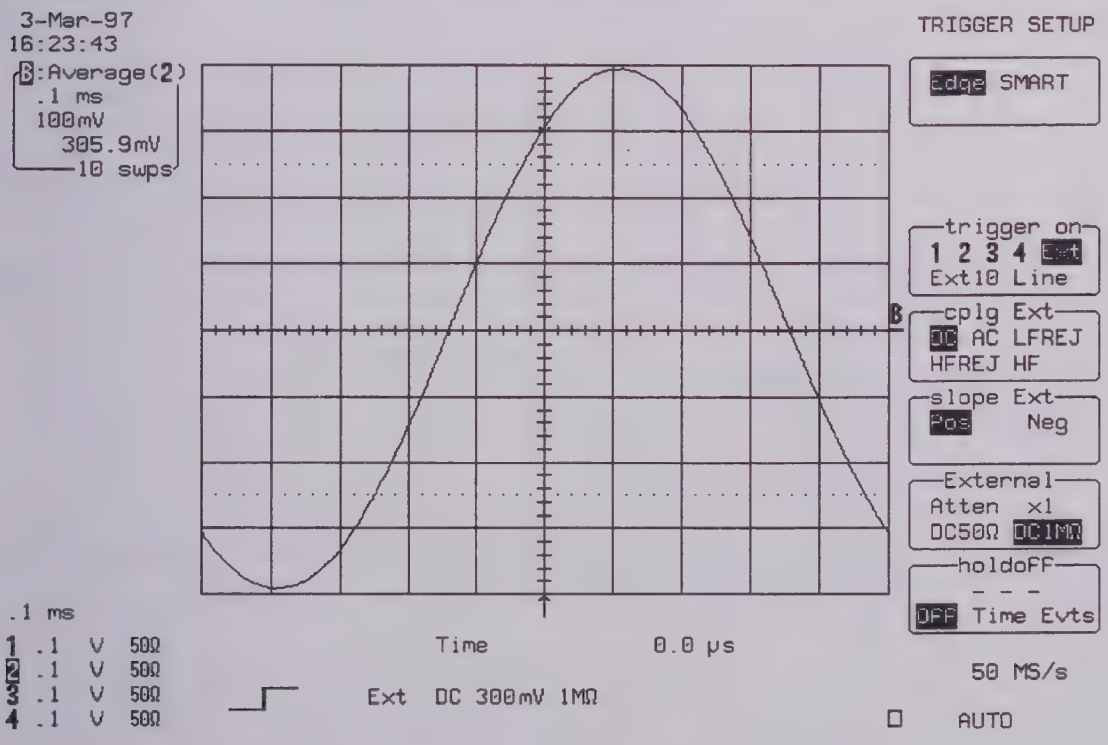
5.10.6 External Trigger at +3 Divisions Threshold

a. DC Coupling

- Recall **574p056.PNL** or configure the DSO as shown in 5.10.5.a and make the following change :

  Set Ext Trigger level : **DC +300 mV**

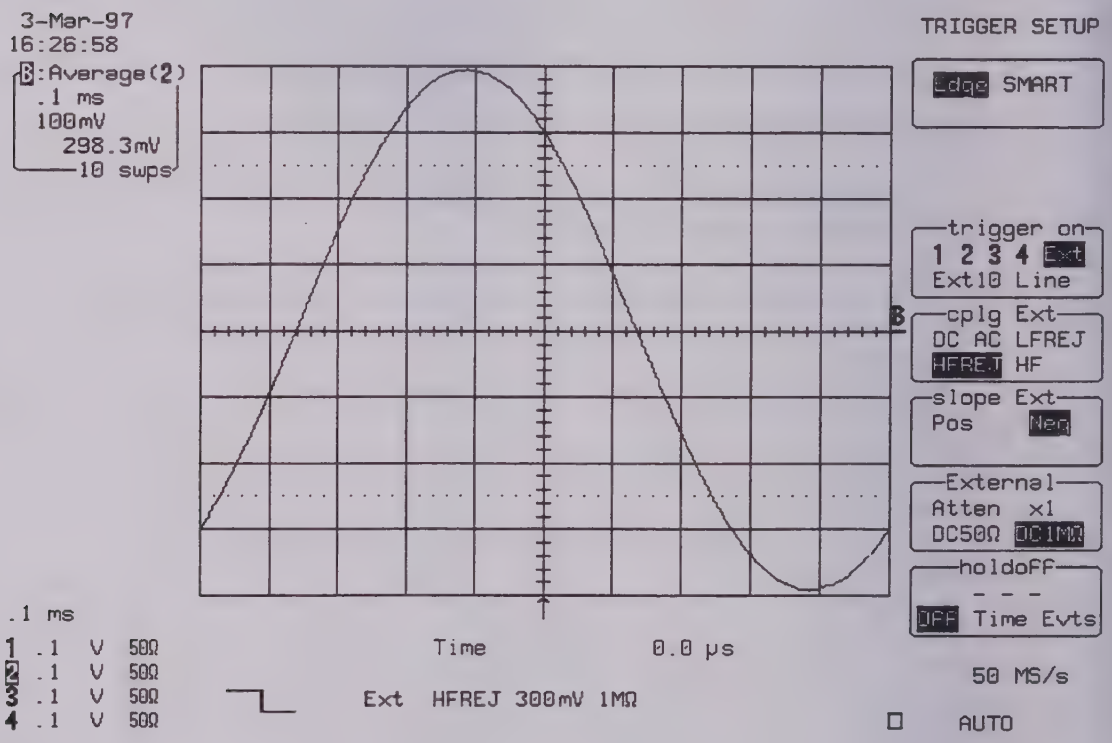
- Connect the test equipment as shown in Figure 5-12.
- Press **Clear Sweeps**,
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope Ext : **Neg**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.

b. HFREJ Coupling

- Set Ext Coupling : **HFREJ**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.



- Set Trigger Slope Ext : **Pos**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.

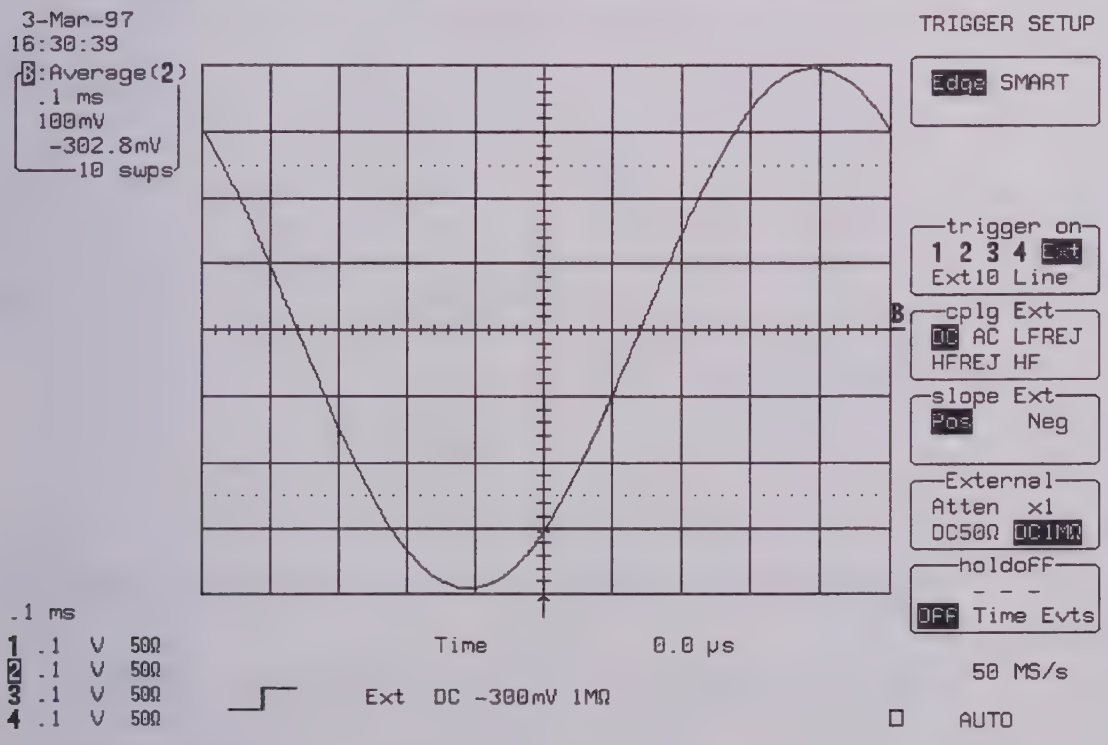
5.10.7 External Trigger at –3 Divisions Threshold

a. DC Coupling

- Recall **574p057.PNL** or configure the DSO as shown in 5.10.5.a and make the following change :

  Set Ext Trigger level : **DC –300 mV**

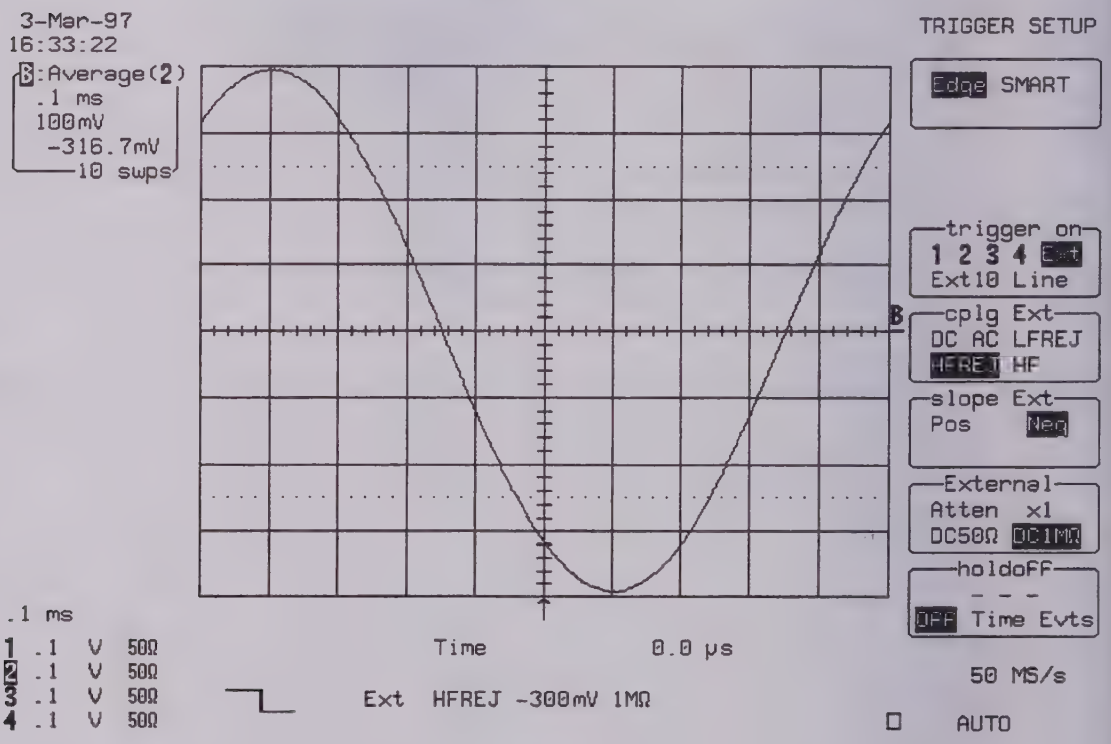
- Connect the test equipment as shown in Figure 5-12.
- Press **Clear Sweeps**.
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope Ext : **Neg**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.

b. HFREJ Coupling

- Set Ext Coupling : **HFREJ**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope Ext : **Pos**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.

5.10.8 External/10 Trigger at 0 Division Threshold

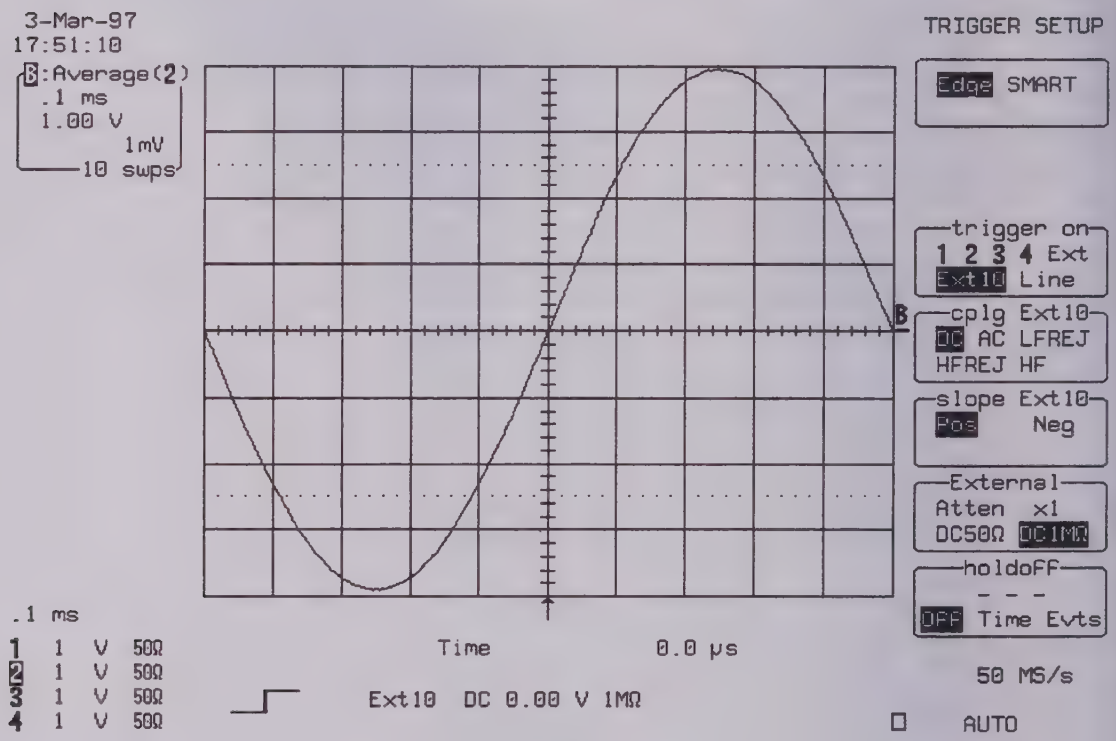
a. DC Coupling

- Recall **574p058.PNL** or configure the DSO :

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channel Trace ON		**Channel 2**
Input Coupling	:	**DC 50Ω**
Input gain	:	**1V/div**
Input offset	:	**0 mV**
Trigger setup	:	**Edge**
Trigger on	:	**Ext/10**
Slope Ext/10	:	**Pos**
Mode	:	**Auto**
Coupling	:	**DC**
Set Trigger level	:	**0.0 mV**
External	:	**DC 1MΩ**
Pre-Trigger Delay	:	**50 %**
Timebase	:	**0.1 msec/div.**
Record up to	:	**50 k samples**
Channel Trace OFF		**Channel 2**
Zoom+Math Trace ON		**B**
Select Math Setup		
For Math	:	**Use at most 5000 points**
Redefine B	:	**Channel 2**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg. Type	:	**Summed**
For	:	**10 sweeps**

- Connect the test equipment as shown in Figure 5-12.
- Set the output of the LeCroy LW420 or equivalent audio frequency signal generator to **1 kHz.**
- Adjust the sine wave output amplitude to get **8 divisions peak to peak .**
- Select Cursors/Measure : **Cursors, Time, Absolute**
- Use the "cursor position" knob, to move the **Time marker** at 0.0 μs

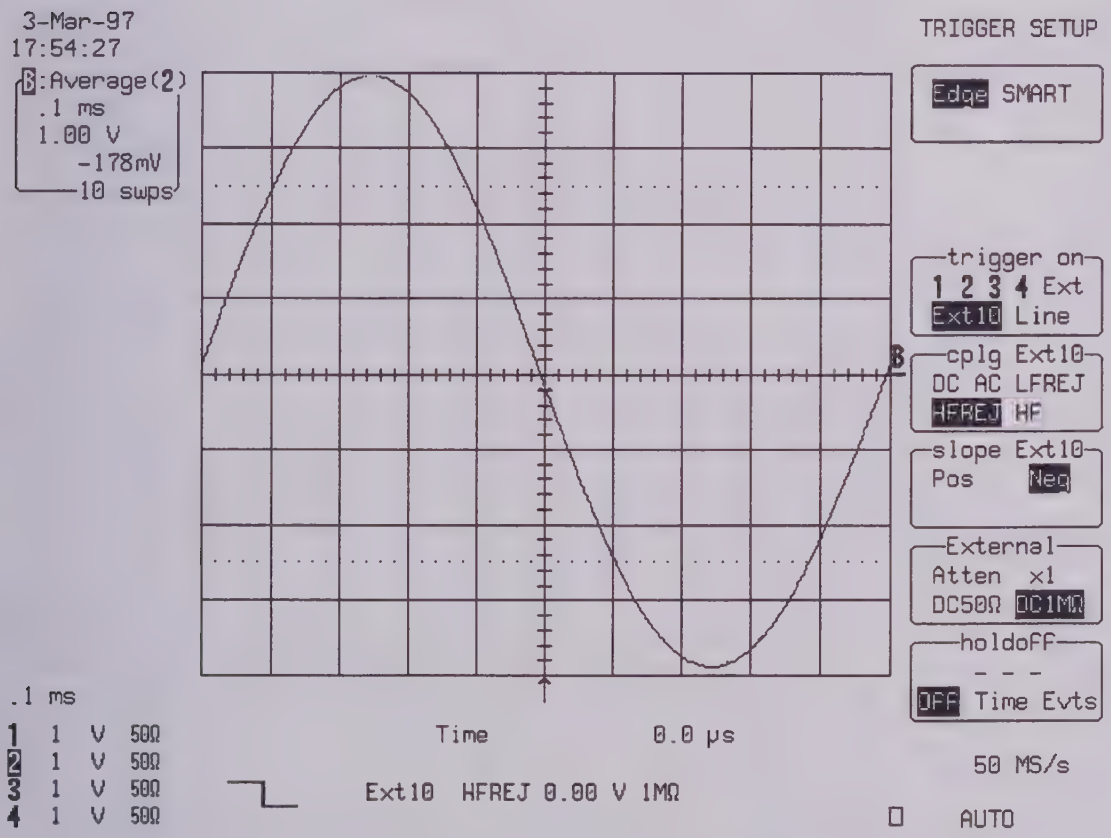
- Press **Clear Sweeps**,
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.



- Set Trigger Slope Ext/10 : **Neg**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.

b. HFREJ Coupling

- Set Coupling Ext/10 : **HFREJ**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.



- Set Trigger Slope Ext/10 : **Pos**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.

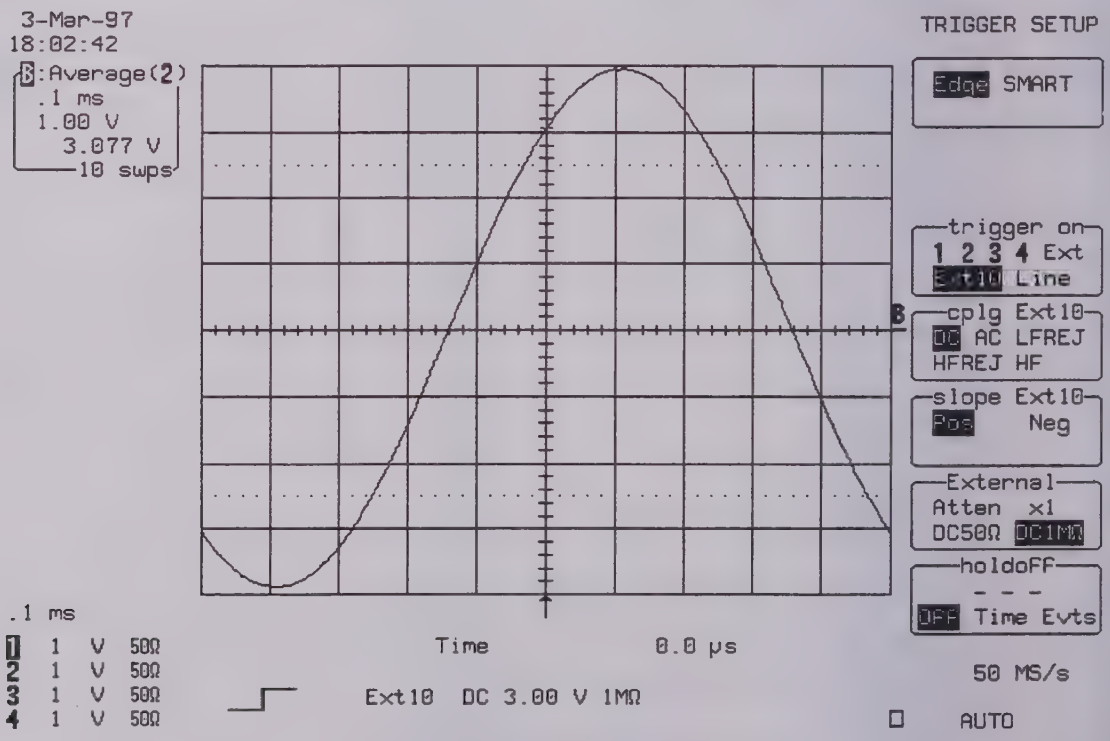
5.10.9 External/10 Trigger at +3 Divisions Threshold

a. DC Coupling

- Recall **574p059.PNL** or configure the DSO as shown in 5.10.8.a and make the following change :

  Set Ext/10 Trigger level : **DC +3 V**

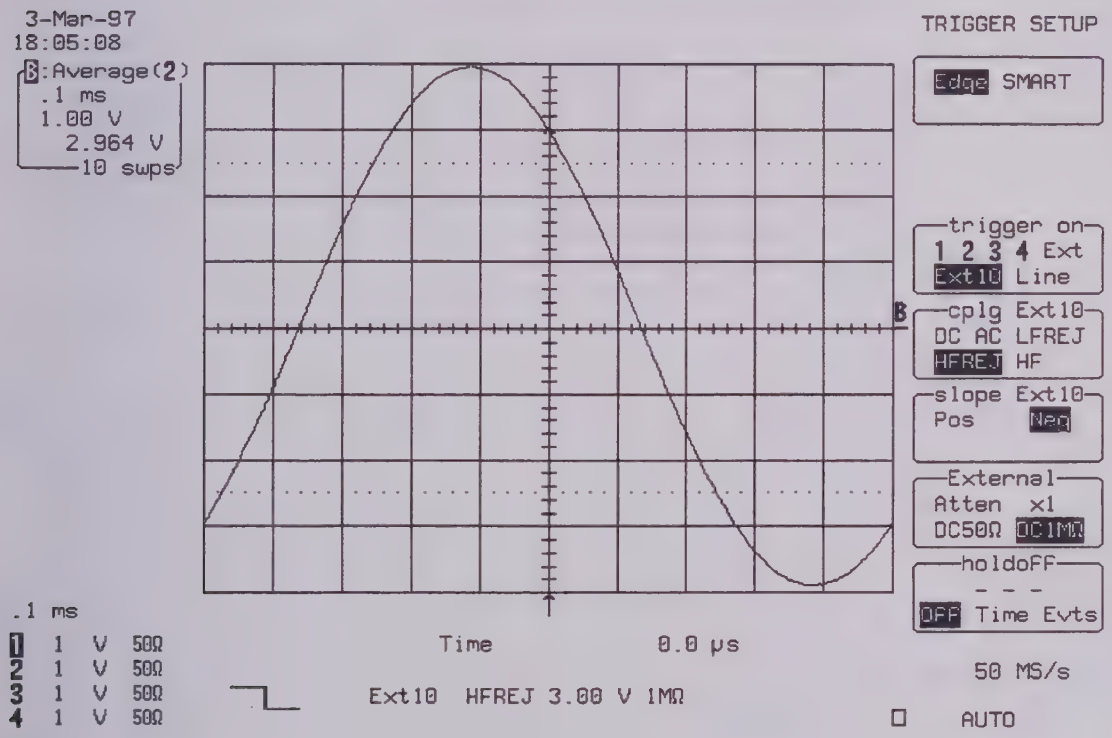
- Connect the test equipment as shown in Figure 5-12.
- Press **Clear Sweeps**,
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope Ext/10 : **Neg**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.

b. HFREJ Coupling

- Set Ext/10 Coupling: **HFREJ**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.



- Set Trigger Slope Ext/10 : **Pos**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.

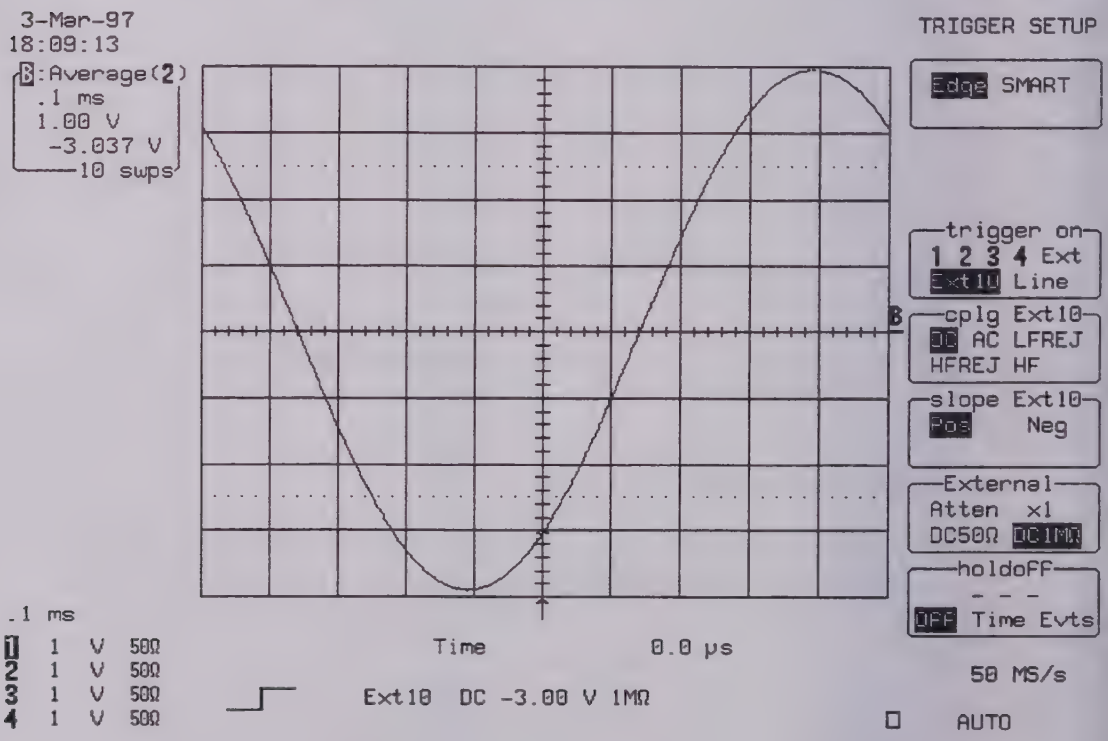
5.10.10 External/10 Trigger at –3 Divisions Threshold

a. DC Coupling

- Recall **574p060.PNL** or configure the DSO as shown in 5.10.5.a and make the following change :

  Set Ext/10 Trigger level : **DC –3 V**

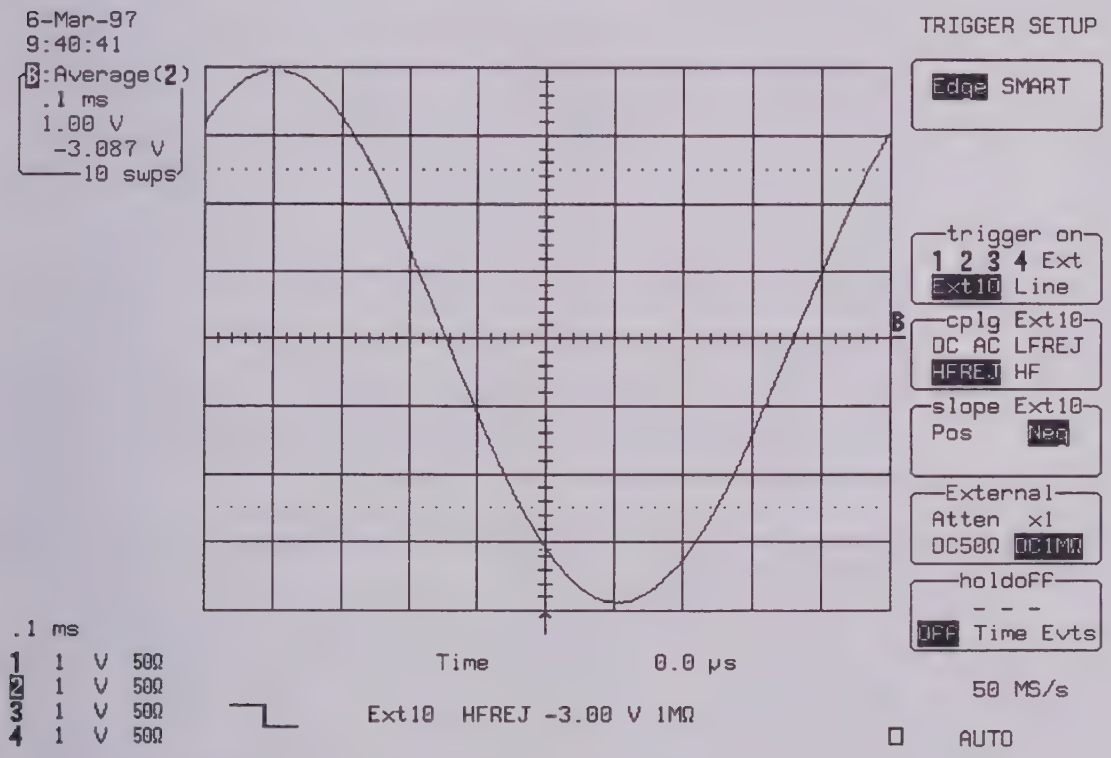
- Connect the test equipment as shown in Figure 5-12.
- Press **Clear Sweeps**.
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope Ext/10 : **Neg**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.

b. HFREJ Coupling

- Set Ext/10 Coupling: **HFREJ**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.



- Set Trigger Slope Ext/10 : **Pos**
- Acquire 10 sweeps and record in Table 20 the **level** readout displayed below 100 mV in the icon **2**, at top left.
- Compare the test results to the corresponding limit in the test record.

5.11 Smart Trigger

5.11.1 Trigger on Pulse Width 10 nsec

a. Pulse Width < 10 nsec

- Recall **574p061.PNL** or configure the DSO

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels trace ON		**Channel 1**
Input coupling	:	**DC 50Ω**
Input gain	:	**.5 V/div.**
Input offset	:	**0 mV**
Trigger setup	:	**Smart**
Setup Smart Trigger		**Glitch**
Trigger on	:	**1**
At the end of	:	**Neg.**
Width < 10 nsec	:	**On**
Width > 10 nsec	:	**Off**
Trigger mode	:	**Norm**
Timebase	:	**5 nsec/div.**

- Connect the **RF output** of the HP8648B generator through a 5ns 50 Ohm BNC coaxial cable into Channel 1.

- Set the generator frequency to **100 MHz**. Adjust the generator output amplitude to get **5 divisions peak to peak .**

- Check that the scope Triggers. Record the test result in Table 21.

- Set Width < 10 nsec **Off** and Width > 10 nsec **ON**

- Check that the scope **doesn't trigger :** slow trigger and no flashes in box next to normal. Record the test result in Table 21.

b. Pulse Width > 10 nsec

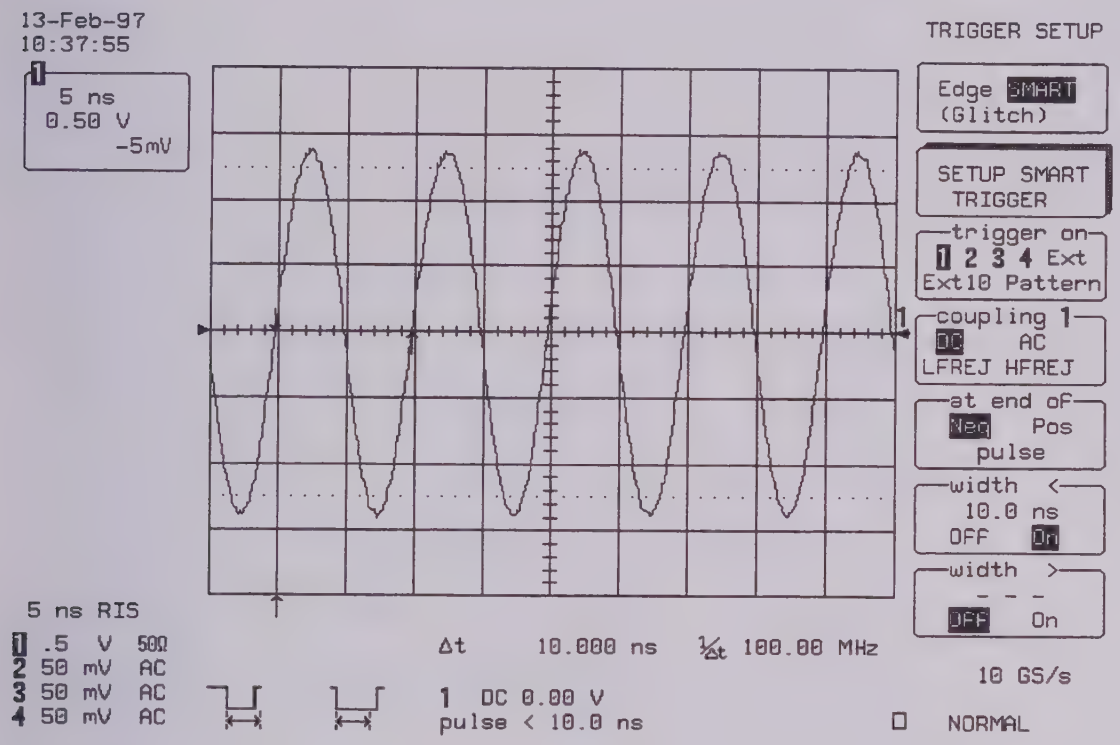
- Set the generator frequency to **40 MHz**.

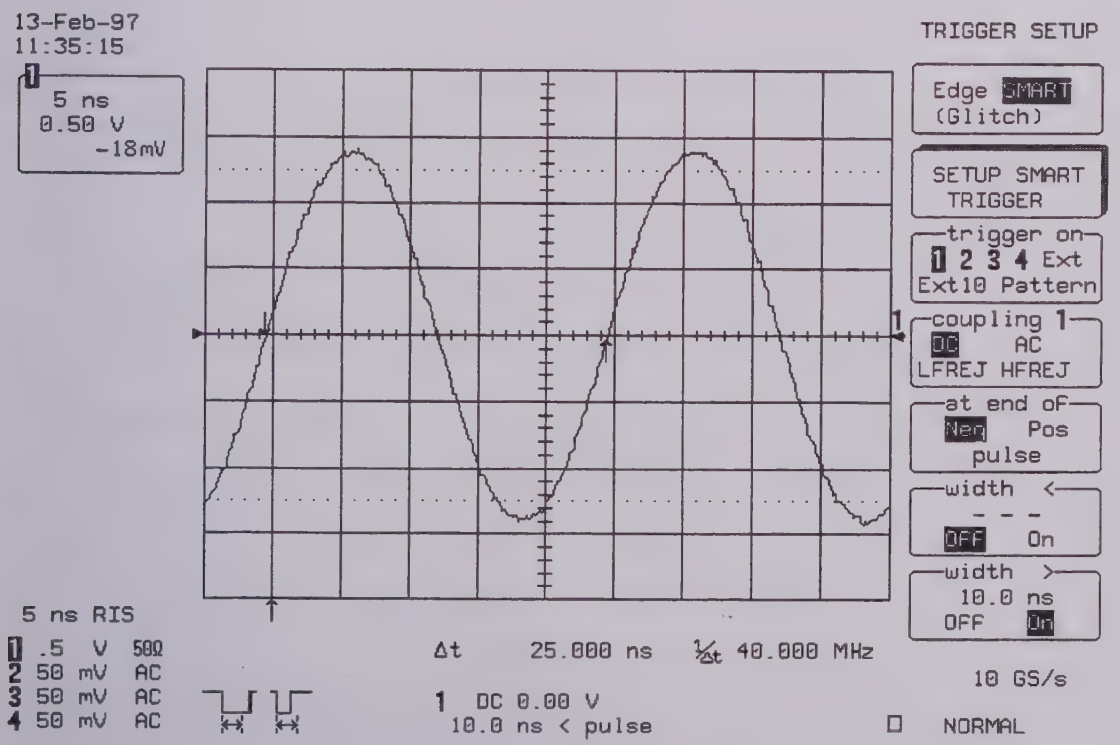
- Set Width < 10 nsec **Off** and Width > 10 nsec **ON**

- Check that the scope Triggers. Record the test result in Table 21.

- Set Width < 10 nsec **On** and Width > 10 nsec **Off**

- Check that the scope **doesn't trigger :** slow trigger and no flashes in box . Record the test result in Table 21.


13-Feb-97
10:37:55
1
5 ns
0.50 V
-5mV
TRIGGER SETUP
Edge SMART
(Glitch)
SETUP SMART
TRIGGER
trigger on
1 2 3 4 Ext
Ext10 Pattern
coupling 1
DC AC
LFREJ HFREJ
at end of
Neg Pos
pulse
width <
10.0 ns
OFF On
width >
- - -
OFF On
5 ns RIS
1 .5 V 50Ω
2 50 mV AC
3 50 mV AC
4 50 mV AC
Δt 10.000 ns 1/Δt 100.00 MHz
10 GS/s
1 DC 0.00 V
pulse < 10.0 ns
NORMAL


13-Feb-97
11:35:15
1
5 ns
0.50 V
-18mV
TRIGGER SETUP
Edge SMART
(Glitch)
SETUP SMART
TRIGGER
trigger on
1 2 3 4 Ext
Ext10 Pattern
coupling 1
DC AC
LFREJ HFREJ
at end of
Neg Pos
pulse
width <
- - -
OFF On
width >
10.0 ns
OFF On
5 ns RIS
1 .5 V 50Ω
2 50 mV AC
3 50 mV AC
4 50 mV AC
Δt 25.000 ns 1/Δt 40.000 MHz
10 GS/s
1 DC 0.00 V
10.0 ns < pulse
NORMAL

5.11.2 Trigger on Pulse Width 100 nsec

a. Pulse Width < 100 nsec

- Recall **574p062.PNL** or configure the DSO as shown in 5.11.1.a and make the following changes :

  Width < 100 nsec : **On**

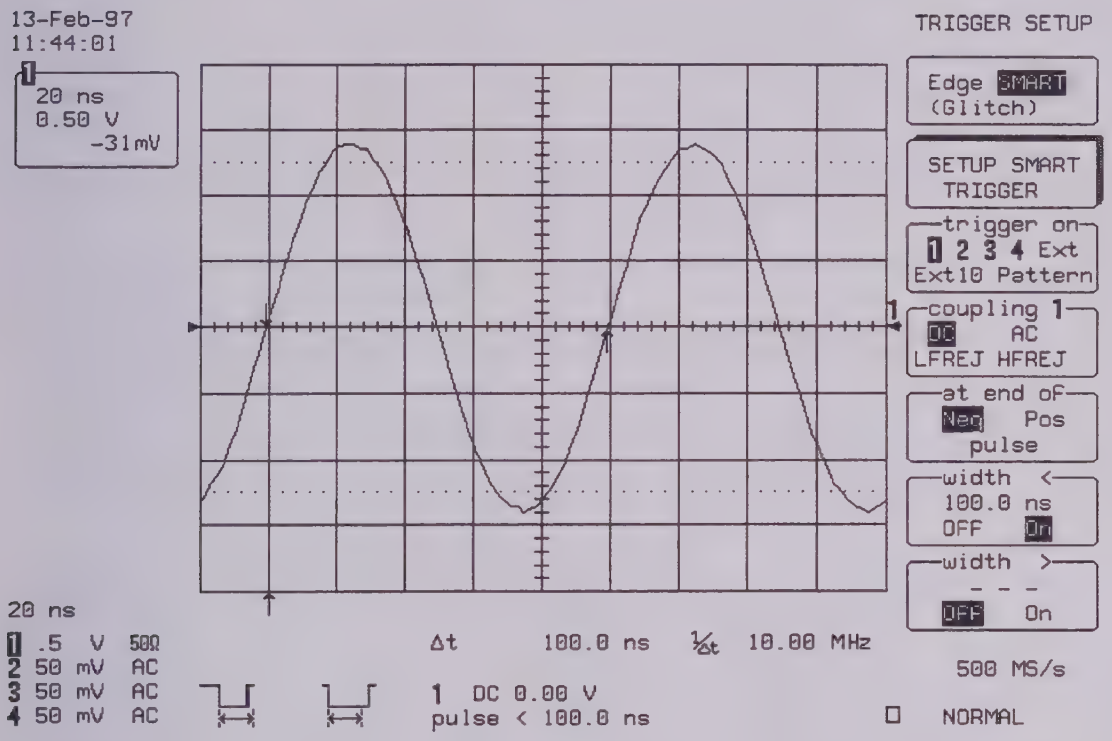
  Width > 100 nsec : **Off**

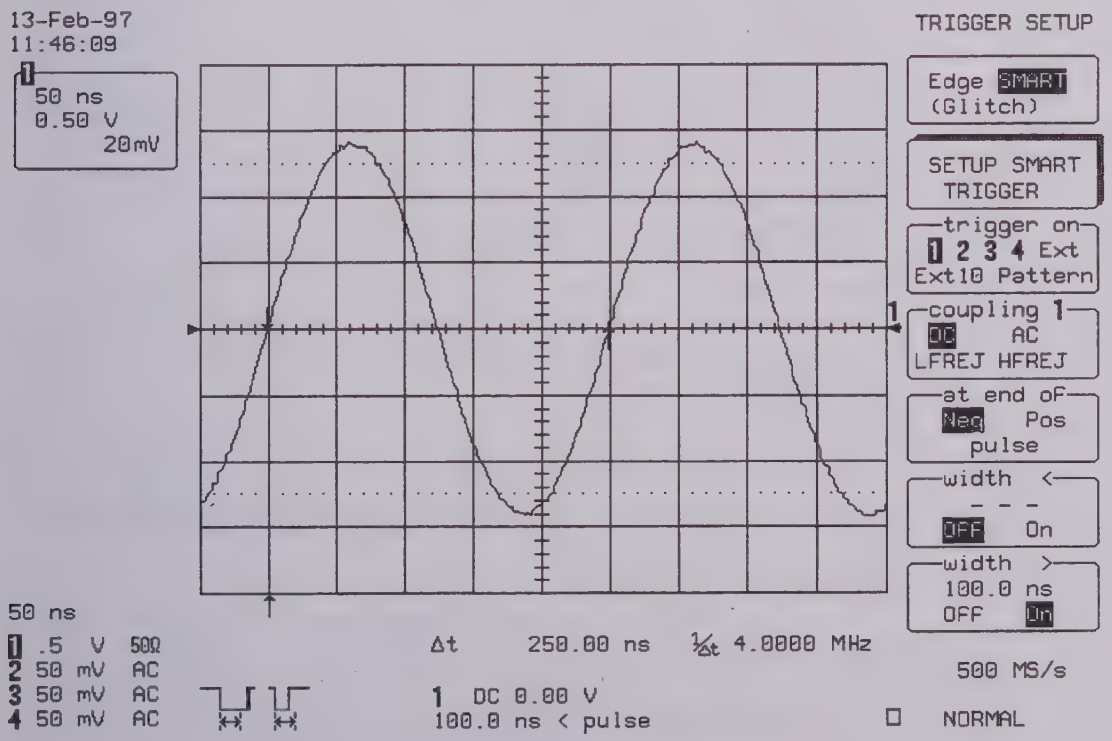
  Timebase : **20 nsec/div.**

- Set the generator frequency to **10 MHz**.
- Check that the scope Triggers. Record the test result in Table 21.
- Set Width < 100 nsec **Off** and Width > 100 nsec **ON**
- Check that the scope **doesn't trigger** : slow trigger and no flashes in box next to normal. Record the test result in Table 21.

b. Pulse Width > 100 nsec

- Set the generator frequency to **4 MHz**.
- Timebase : **50 nsec/div.**
- Set Width < 100 nsec **Off** and Width > 100 nsec **ON**
- Check that the scope Triggers. Record the test result in Table 21.
- Set Width < 100 nsec **On** and Width > 100 nsec **Off**
- Check that the scope **doesn't trigger** : slow trigger and no flashes in box. Record the test result in Table 21.


13-Feb-97
11:44:01
20 ns
0.50 V
-31mV
TRIGGER SETUP
Edge SMART
(Glitch)
SETUP SMART
TRIGGER
trigger on
1 2 3 4 Ext
Ext10 Pattern
coupling 1
DC AC
LFREJ HFREJ
at end of
Neg Pos
pulse
width <
100.0 ns
OFF On
width >
- - -
OFF On
20 ns
1 .5 V 50Ω
2 50 mV AC
3 50 mV AC
4 50 mV AC
Δt 100.0 ns 1/Δt 10.00 MHz
500 MS/s
1 DC 0.00 V
pulse < 100.0 ns
NORMAL


13-Feb-97
11:46:09
50 ns
0.50 V
20mV
TRIGGER SETUP
Edge SMART
(Glitch)
SETUP SMART
TRIGGER
trigger on
1 2 3 4 Ext
Ext10 Pattern
coupling 1
DC AC
LFREJ HFREJ
at end of
Neg Pos
pulse
width <
- - -
OFF On
width >
100.0 ns
OFF On
50 ns
1 .5 V 50Ω
2 50 mV AC
3 50 mV AC
4 50 mV AC
Δt 250.00 ns 1/Δt 4.0000 MHz
500 MS/s
1 DC 0.00 V
100.0 ns < pulse
NORMAL

5.12 Time Base Accuracy

5.12.1 Description

An external sine wave generator of **1 MHz** with a frequency accuracy better than 1 PPM is used.

Specifications

500 MHz clock : accuracy : ≤ **±0.001 % or ≤ ±10 PPM**

5.12.2 500 MHz Clock Verification Procedure

- Recall **574p063.PNL** or configure the DSO

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels trace ON		**Channel 1**
Input coupling	:	**DC 50Ω**
Input gain	:	**.5 V/div.**
Input offset	:	**0 mV**
Trigger setup	:	**Edge**
Trigger on	:	**1**
Coupling 1	:	**DC**
Slope 1	:	**Pos**
Level 1	:	**0.5 V**
Trigger mode	:	**Norm**
Delay	:	**0 %**
Timebase	:	**.5 µsec/div.**
Channel use	:	**4**
Record up to	:	**50 k**

- Connect the **RF output** of the HP8648B generator through a 5ns 50 Ohm BNC coaxial cable into Channel 1.
- Set the generator frequency to **1 MHz**.
- Adjust the generator output amplitude to get **5 divisions peak to peak .**
- Store Channel 1 in Memory 1
- Recall **574p064.PNL** or make the following change :
- Set Post-trigger delay to **5.00 msec**
- Recall Memory **1 to A**

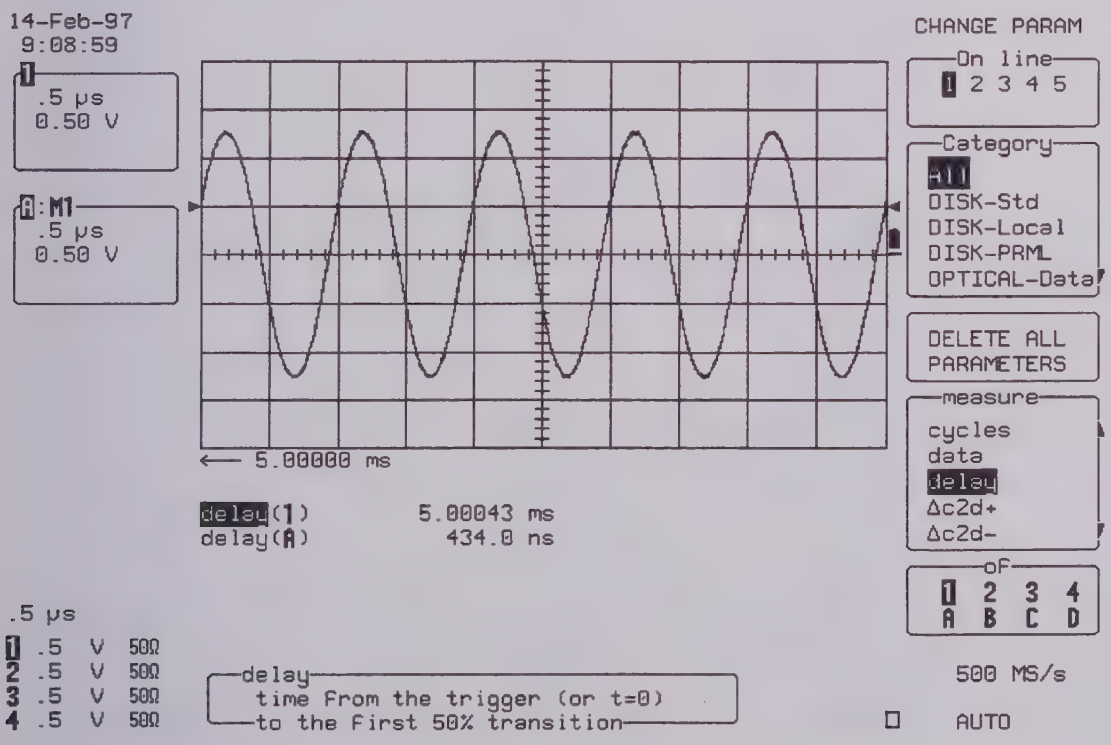
- Press : **Cursors/Measure**
- Measure : **Parameters**
- Mode : **Custom**
- Statistics : **Off**

- Change parameters

- On line 1 : **Delay of 1**
- On line 2 : **Delay of A**

- Check that the displayed Channel 1 trace is **aligned** with the sine wave from memory 1.

- This allows the accuracy of the time base clock to be checked **5000 periods** after the trigger point. A difference of **±0.05 µsec** corresponds to **±10 PPM**.



- Calculate the Difference **{[delay(A) - delay(1)]+ 5 msec}.**

- Record the test result in Table 22, and compare it to the limit in the test record.

5.13 Overshoot and Rise time (10 % - 90 %)

Specifications

DC 50Ω, 50 mV/div., : overshoot < 20 %, rise time < 0.5 ns
DC 1MΩ, 100 mV/div., : rise time < 1.5 ns

a. DC 50Ω

- Recall **574p065.PNL** or configure the DSO

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels trace ON		**Channel 1**
Input coupling	:	**DC 50Ω** on all 4 Channels
Input gain	:	**0.1 V/div.** on all 4 Channels
Input offset	:	**–250 mV** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**1**
Coupling 1	:	**DC**
Slope 1	:	**Pos**
Level 1	:	**250 mV**
Trigger mode	:	**Norm**
Delay	:	**30 % Pre-Trigger**
Timebase	:	**1 nsec/div.**
Channel use	:	**4** RIS
Record up to	:	**50 k**
Turn on trace	:	**A**
Select Math Setup		
For Math	:	**Use at most 1000 points**
Use Math ?	:	**Yes**
Math Type	:	**Average**
Avg Type	:	**Summed**
Of	:	**Channel 1**
Sweeps	:	**100**
Turn off trace	:	**Channel 1**
Cursors/Measure	:	**Parameters**
Mode	:	**Custom**
Statistics	:	**Off**
Change Parameters	:	
On displayed trace	:	**A**
On line 1	:	
Measure	:	**Over + of A**
On line 2	:	
Measure	:	**Rise of A**

- Connect the fast pulse generator 4969A and PB049 power adapter, or equivalent as shown in Figure 5-13.

- Set the 4969A frequency to **1 kHz**

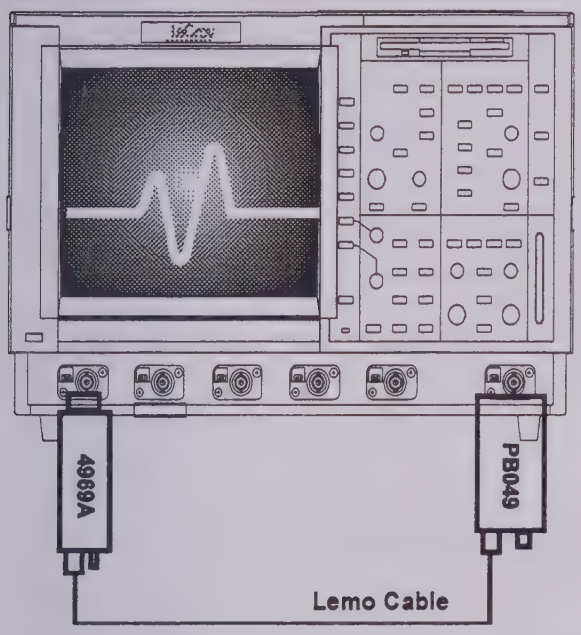


Figure 5-13 : 50 Ω Overshoot & Rise time Equipment Setup

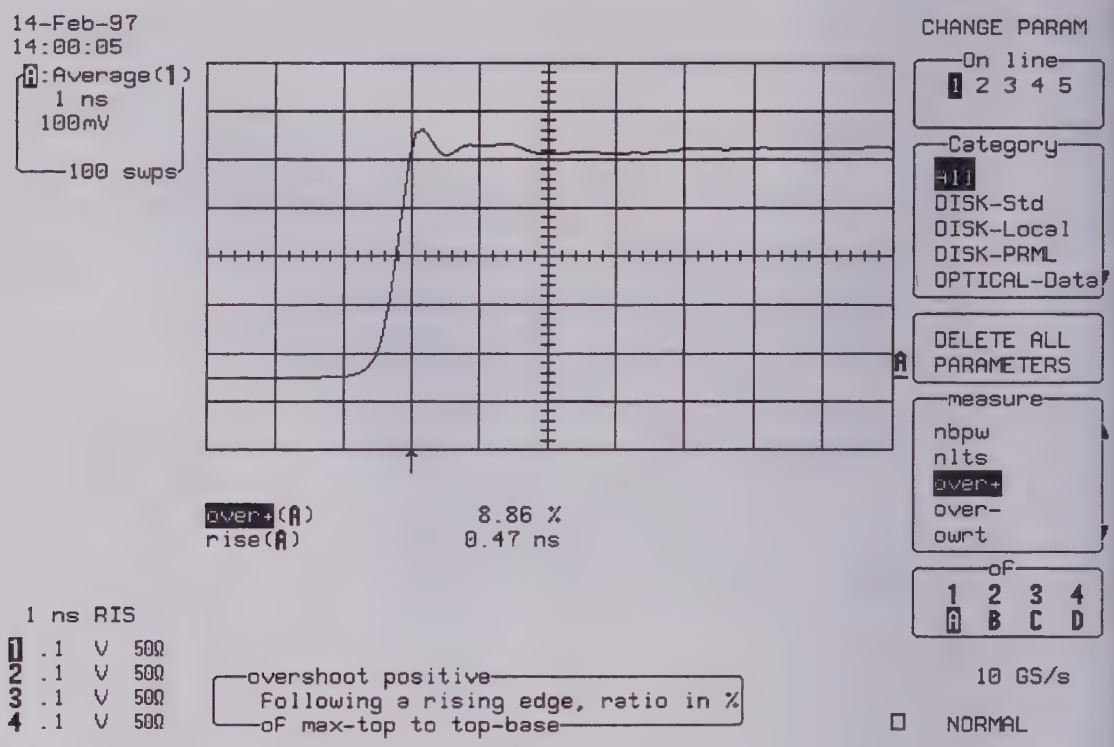
- Press **Clear Sweep**

- After 100 sweeps record **over+(A)** and **rise(A)** measurements in Table 23.

- Repeat the DC 50Ω Overshoot and Rise time test for the other channels, substituting channel controls and input connector.

- Recall **574p066.PNL** for Channel 2, **574p067.PNL** for Channel3 **574p068.PNL** for Channel 4, or configure the DSO as shown in 5.13.a. and make the necessary changes.

- Record the test results in Table 23, and compare the results to the limits.



b. DC 1MΩ

- Recall **574p069.PNL** or configure the DSO as shown in 5.13.a. and make the following change :

  Set Input Coupling: **DC 1MΩ** on all 4 Channels
  Input gain : **50 mV/div.** on all 4 Channels
  Input offset : **–150 mV** on all 4 Channels
  Trigger Level : **75 mV**
  Timebase : **1 nsec/div.**

- Terminate the output of the 4969A Pulser with the 4962-9 adapter (50Ω to 1MΩ) as shown in Figure 5-14.

- Press **Clear Sweep**. After **100 sweeps** record **over+(A)** and **rise(A)** in Table23.

- Repeat the DC 1MΩ Overshoot and Rise time test for the other channels, substituting channel controls and input connector.

- Recall **574p070.PNL** for Channel 2, **574p071.PNL** for Channel3 **574p072.PNL** for Channel 4, or configure the DSO as shown in 5.13.a. and make the necessary changes.

- Record the test results in Table 23, and compare the results to the limits.

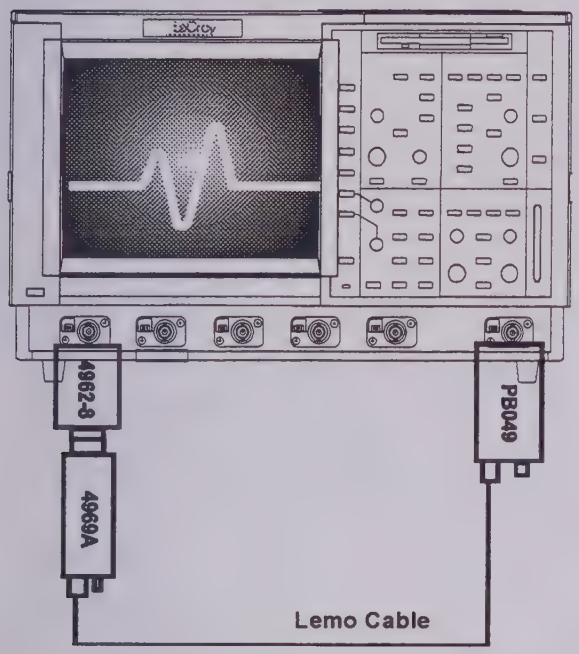
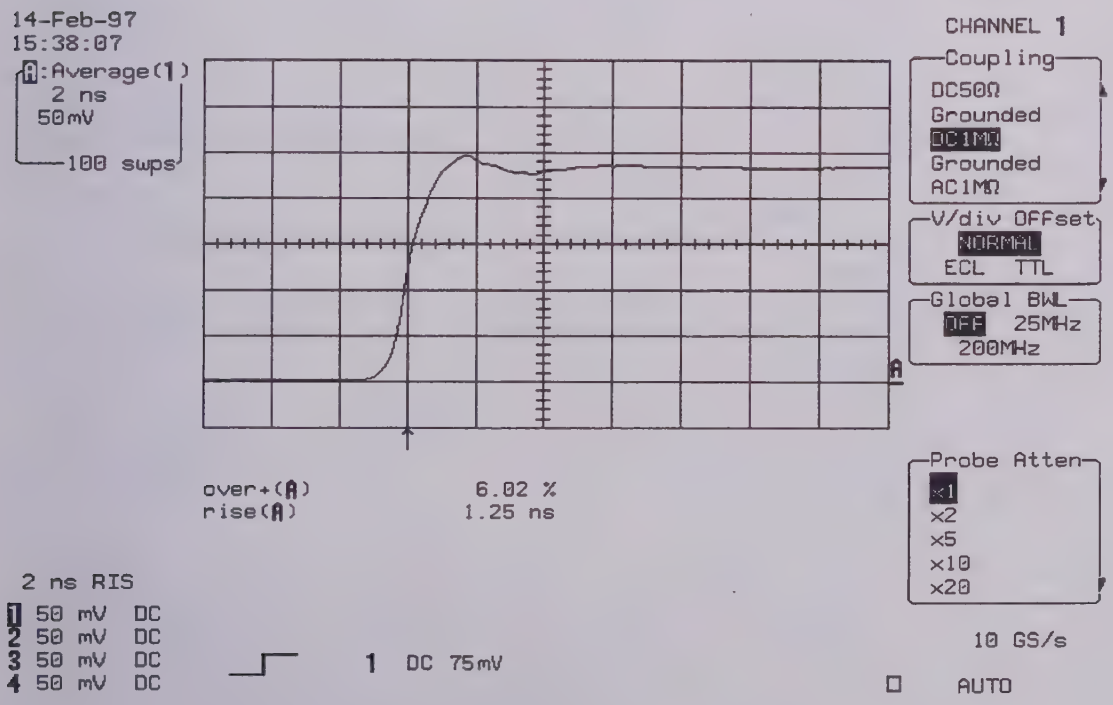


Figure 5-14 : 1MΩ Overshoot & Rise time Equipment Setup



5.14 Overload

Specifications

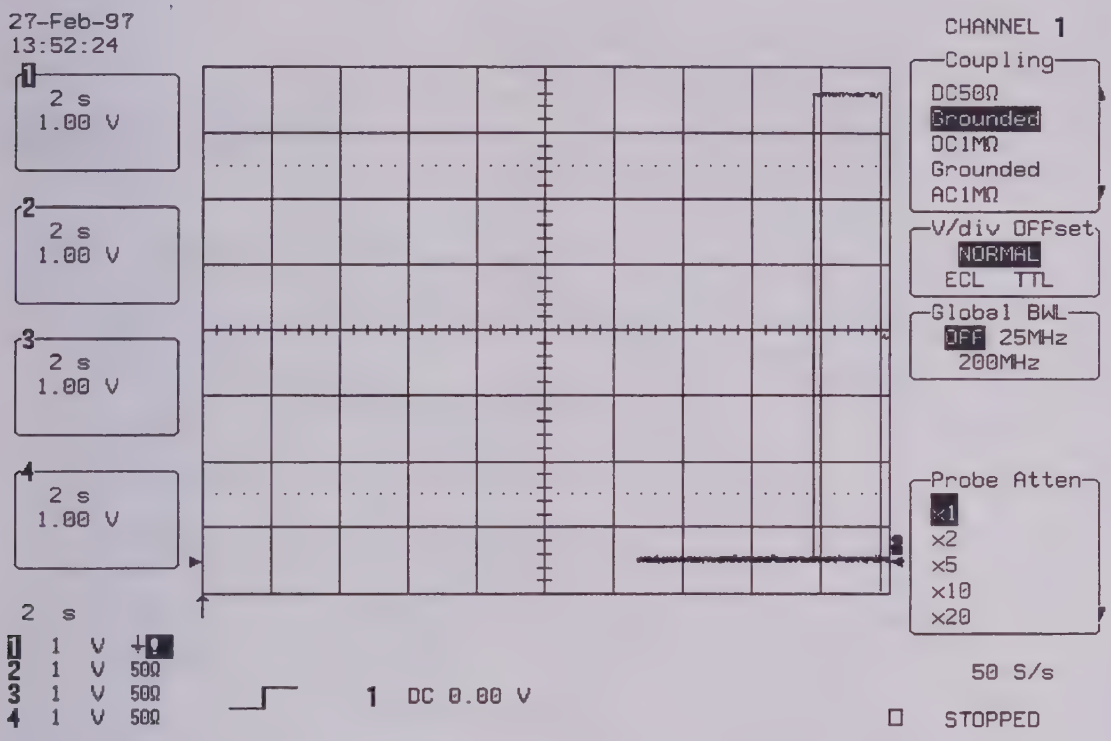
1 Watt into 50Ω : Overload Trip < 17 seconds

a. Channel Overload Trip

- Recall **574p073.PNL** or configure the DSO

Panel Setups	:	**Recall FROM DEFAULT SETUP**
Channels Trace ON		**Channel 1, Channel 2, Channel 3 & Channel 4**
Input coupling	:	**DC 50Ω** on all 4 Channels
Input gain	:	**1 V/div.** on all 4 Channels
Input offset	:	**–3.5 V** on all 4 Channels
Trigger setup	:	**Edge**
Trigger on	:	**1**
Coupling 1	:	**DC**
Slope 1	:	**Pos**
Level 1	:	**0 V**
Trigger mode	:	**Norm**
Delay	:	**zero**
Timebase	:	**2 sec/div.**
Channel use	:	**4**
Record up to	:	**1000 samples**

- Set the output of the external **DC voltage source** to **+7.07 Volt** corresponding to 1 Watt into 50Ω.
- Connect the **DC voltage reference source** through a BNC cable into Channel1.
- When the channel **overload trips** press **Stop** to halt the acquisition.
- **Measure** on the screen the **overload trip time** and record it in Table 24.
- Repeat the above tests for Channel 2, Channel 3 and Channel 4 substituting the input connector.
- Record the test results in Table 24, and compare the results to the limits.
- For all Channel **clear the overload** by selecting DC 50Ω in the Coupling menu.
- Set Timebase : **5 sec/div.**



- Set the output of the external **DC voltage source** to **+5.00 Volt** corresponding to 0.5 Watt into 50Ω.

- For all channels check that the overload doesn't trip for at least **35** seconds. Record the test result in Table 24.

b. External Overload Trip

- Recall **574p074.PNL**, or configure the DSO as shown in 5.14.and make the following changes.

Channel Trace ON	:	**Channel 2**
Input coupling	:	**DC 1MΩ**
Trigger on	:	**Ext**
Slope Ext	:	**Pos.**
External	:	**DC 50Ω**
Mode	:	**Norm**
Set Trigger level	:	**DC 0.0 mV**

- Connect the test equipment as shown in Figure 5-15.

- Set the output of the external **DC voltage source** to **+7.07 Volt**

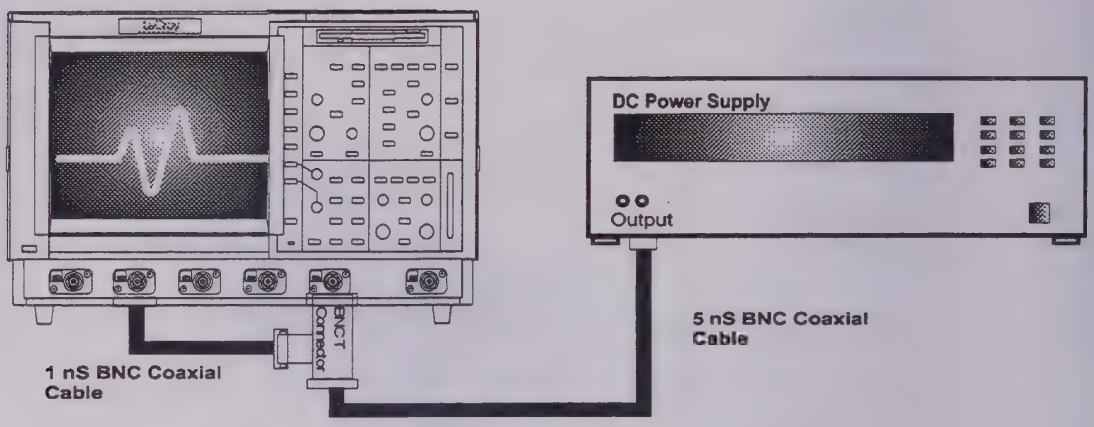
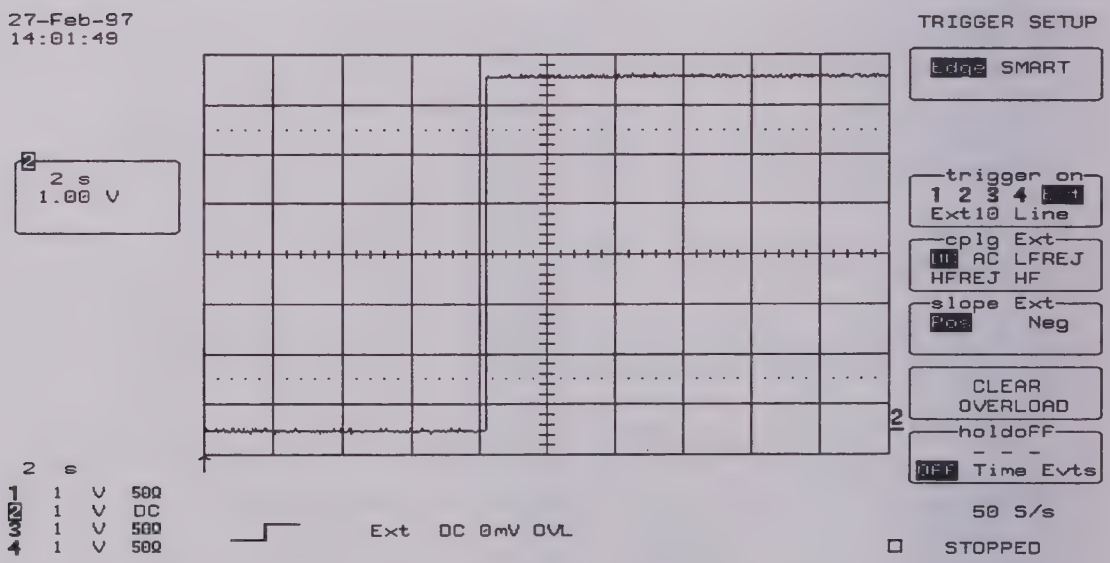


Figure 5-15 : External Overload Equipment Setup

- When the External **overload trips** press **Stop** to halt the acquisition.
- **Measure** on the screen the **overload trip time** and record it in Table 24. Compare the result to the limit in the test record.
- Press **clear overload** in the trigger setup menu.



- Set Timebase : **5 sec/div.**
- Set the output of the external **DC voltage source** to **+5.00 Volt**
- Check that the External overload doesn't trip for at least **35** seconds. Record the test result in Table 24.

LeCroy Digital Storage Oscilloscope

Performance Certificate

LC574A Manual Performance Test Procedure Version A - July 1997

Model_____ Serial Number_____ Customer_____

Software Version_____

Inspection Date_____ Next Due_____

Temperature_____ Humidity_____%

Tested By_____ Report Number_____

Place of Inspection_____

Condition found_____ Condition Left_____

Approved By_____

Test Equipment Used

Instrument	Model	S/N	Cal Due Date
Signal Generator Radio Frequency	_____	_____	_____
Signal Generator Audio Frequency	_____	_____	_____
Voltage Generator DC Power Supply	_____	_____	_____
Step Generator Fast Pulser	_____	_____	_____
Digital Multimeter Voltmeter, Ohmmeter	_____	_____	_____

Traceable to_____

Table 1 : LC574A Test Report

Coupling	Volts/div.	Measured Channel 1 Impedance Ω, MΩ	Measured Channel 2 Impedance Ω, MΩ	Measured Channel 3 Impedance Ω, MΩ	Measured Channel 4 Impedance Ω, MΩ	Measured External Impedance Ω, MΩ	Measured External/10 Impedance Ω, MΩ	Lower Limit Ω, MΩ	Upper Limit Ω, MΩ
DC 1MΩ	50 mV/div							0.99 MΩ	1.01 MΩ
DC 1MΩ	200 mV/div					N/A	N/A	0.99 MΩ	1.01 MΩ
AC 1MΩ	50 mV/div					N/A	N/A	1.08 MΩ	1.14 MΩ
AC 1MΩ	200 mV/div					N/A	N/A	0.98 MΩ	1.02 MΩ
DC 50Ω	50 mV/div						N/A	49.5 Ω	50.5 Ω
DC 50Ω	200 mV/div					N/A	N/A	49.5 Ω	50.5 Ω
DC 1MΩ Grounded	50 mV/div					N/A	N/A	0.98 MΩ	1.02 MΩ

Table 2 : Impedance Test Record

Coupling	Volts/div.	Measured Channel 1 Leakage mV	Measured Channel 2 Leakage mV	Measured Channel 3 Leakage mV	Measured Channel 4 Leakage mV	Measured External Leakage mV	Lower Limit mV	Upper Limit mV
DC 1MΩ	50 mV/div					N/A	–1	+1
DC 1MΩ	200 mV/div					N/A	–1	+1
DC 50Ω	50 mV/div						–1	+1
DC 50Ω	200 mV/div					N/A	–1	+1

Table 3 : Leakage Voltage Test Record

Coupling	Time/Div.	Measured Channel 1 pkpk mV	Measured Channel 2 pkpk mV	Measured Channel 3 pkpk mV	Measured Channel 4 pkpk mV	Limits mV
DC 1MΩ	20 ms					7.2
DC 1MΩ	1 ms					7.2
DC 1MΩ	50 µs					7.2
DC 1MΩ	10 µs					7.2
AC 1MΩ	10 µs					7.2
DC 50Ω	10 µs					7.2
DC 50Ω	50 µs					7.2
DC 50Ω 2 Ch Combined	5 µs	disabled			disabled	7.2
DC 50Ω 4 Ch Combined	2 µs	disabled		disabled	disabled	7.2

Table 4 : Peak to Peak Noise Test Record

Coupling	Time/Div.	Measured Channel 1 sdev mV	Measured Channel 2 sdev mV	Measured Channel 3 sdev mV	Measured Channel 4 sdev mV	Limits mV
DC 1MΩ	20 ms					0.72
DC 1MΩ	1 ms					0.72
DC 1MΩ	50 µs					0.72
DC 1MΩ	10 µs					0.72
AC 1MΩ	10 µs					0.72
DC 50Ω	10 µs					0.72
DC 50Ω	50 µs					0.72
DC 50Ω 2 Ch Combined	5 µs	disabled			disabled	1.08
DC 50Ω 4 Ch Combined	2 µs	disabled		disabled	disabled	1.08

Table 5 : RMS Noise Test Record

Coupling	Volts/div.	Measured Channel 1 Mean (A) mV	Measured Channel 2 Mean (B) mV	Measured Channel 3 Mean (C) mV	Measured Channel 4 Mean (D) mV	Lower Limit mV	Upper Limit mV
DC 1MΩ	5 mV					–2	+2
DC 1MΩ	10 mV					–1.6	+1.6
DC 1MΩ	20 mV					–3.2	+3.2
DC 1MΩ	50 mV					–8	+8
DC 1MΩ	.1 V					–16	+16
DC 1MΩ	1 V					–160	+160

Table 6 : DC 1MΩ Ground Line Test Record

Coupling	Volts/div.	Measured Channel 1 Mean (A) mV	Measured Channel 2 Mean (B) mV	Measured Channel 3 Mean (C) mV	Measured Channel 4 Mean (D) mV	Lower Limit mV	Upper Limit mV
DC 50Ω	5 mV					–2	+2
DC 50Ω	10 mV					–1.6	+1.6
DC 50Ω	20 mV					–3.2	+3.2
DC 50Ω	50 mV					–8	+8
DC 50Ω	.1 V					–16	+16
DC 50Ω	1 V					–160	+160
DC 50Ω 2 Ch Combined	.2 V	disabled			disabled	–48	+48
DC 50Ω 4 Ch Combined	.2 V	disabled		disabled	disabled	–64	+64

Table 7 : DC 50Ω Ground Line Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean–DMM	DMM 2	Mean (B)	Δ 2 Mean–DMM	DMM 3	Mean (C)	Δ 3 Mean–DMM	DMM 4	Mean (D)	Δ 4 Mean–DMM	mV
5 mV	X 100	+1.5 V													±1.2
10 mV	X 100	+3.0 V													±1.6
20 mV	X 100	+6.0 V													±3.2
50 mV	X 10	+1.5V													±8
.1 V	X 10	+3.0 V													±16
1 V	X 1	+3.0 V													±160

Table 8 : DC 50Ω, Positive DC Accuracy Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean–DMM	DMM 2	Mean (B)	Δ 2 Mean–DMM	DMM 3	Mean (C)	Δ 3 Mean–DMM	DMM 4	Mean (D)	Δ 4 Mean–DMM	mV
5 mV	X 100	+1.5 V													±1.2
.1 V	X 10	+3.0 V													±16
5 V	X 1	+15.0 V													±800

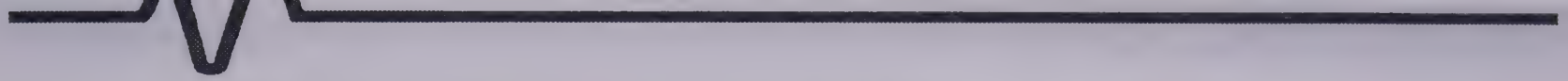
Table 9 : DC 1MΩ, Positive DC Accuracy Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean–DMM	DMM 2	Mean (B)	Δ 2 Mean–DMM	DMM 3	Mean (C)	Δ 3 Mean–DMM	DMM 4	Mean (D)	Δ 4 Mean–DMM	mV
5 mV	X 100	–1.5 V													±1.2
10 mV	X 100	–3.0 V													±1.6
20 mV	X 100	–6.0 V													±3.2
50 mV	X 10	–1.5V													±8
.1 V	X 10	–3.0 V													±16
1 V	X 1	–3.0 V													±160

Table 10 : DC 50Ω, Negative DC Accuracy Test Record

Volts /div.	Attenuator	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
			DMM 1	Mean (A)	Δ 1 Mean–DMM	DMM 2	Mean (B)	Δ 2 Mean–DMM	DMM 3	Mean (C)	Δ 3 Mean–DMM	DMM 4	Mean (D)	Δ 4 Mean–DMM	mV
5 mV	X 100	–1.5 V													±1.2
.1 V	X 10	–3.0 V													±16
5 V	X 1	–15.0 V													±800

Table 11 : DC 1MΩ, Negative DC Accuracy Test Record



Coupling	DSO Offset	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
DC			DMM 1	Mean (A)	Δ 1 Mean– DMM	DMM 2	Mean (B)	Δ 2 Mean– DMM	DMM 3	Mean (C)	Δ 3 Mean– DMM	DMM 4	Mean (D)	Δ 4 Mean– DMM	mV
50 Ω	+1 V	–1 V													±11.2
1 MΩ	+1 V	–1 V													±11.2

Table 12 : Positive Offset Test Record

Coupling	DSO Offset	P S Output	Measured Channel 1 V & mV			Measured Channel 2 V & mV			Measured Channel 3 V & mV			Measured Channel 4 V & mV			Limits
DC			DMM 1	Mean (A)	Δ 1 Mean– DMM	DMM 2	Mean (B)	Δ 2 Mean– DMM	DMM 3	Mean (C)	Δ 3 Mean– DMM	DMM 4	Mean (D)	Δ 4 Mean– DMM	mV
50 Ω	–1 V	+1 V													±11.2
1 MΩ	–1 V	+1 V													±11.2

Table 13 : Negative Offset Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit	Upper Limit
MHz	mW	mV	Sdev(1) mV	Ratio(1) to 0.3	Sdev(2) mV	Ratio(2) to 0.3	Sdev(3) mV	Ratio(3) to 0.3	Sdev(4) mV	Ratio(4) to 0.3		
0.300	0.200			N/A		N/A		N/A		N/A	N/A	N/A
1.1	0.200										0.94	1.06
30.1	0.200										0.94	1.06
250.1	0.200										0.88	1.13
750.1	0.200										0.84	1.18
1000.1	0.200										0.70	N/A

Table 14 : DC 50Ω, 50 mV/div. Bandwidth Test Record

Frequency	Measured Power	Generator Amplitude	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit	Upper Limit
MHz	mW	mV	Sdev(1) mV	Ratio(1) to 0.3	Sdev(2) mV	Ratio(2) to 0.3	Sdev(3) mV	Ratio(3) to 0.3	Sdev(4) mV	Ratio(4) to 0.3		
0.300	0.800			N/A		N/A		N/A		N/A	N/A	N/A
1.1	0.800										0.94	1.06
30.1	0.800										0.94	1.06
250.1	0.800										0.88	1.13
750.1	0.800										0.84	1.18
1000.1	0.800										0.70	N/A

Table 15 : DC 50Ω, 100 mV/div. Bandwidth Test Record

DSO Global BWL	Amplitude at 300 kHz	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit	Upper Limit
MHz	Sdev mV	Sdev(1) mV	Freq(1) MHz	Sdev(2) mV	Freq(2) MHz	Sdev(3) mV	Freq(3) MHz	Sdev(4) mV	Freq(4) MHz	MHz	MHz
25	200	140		140		140		140		10	37
200	200	140		140		140		140		110	290

Table 16 : DC 50Ω, Bandwidth Limiter Test Record

Frequency	Measured Channel 1		Measured Channel 2		Measured Channel 3		Measured Channel 4		Lower Limit
MHz	Sdev(1) mV	Ratio(1) to 0.3	Sdev(2) mV	Ratio(2) to 0.3	Sdev(3) mV	Ratio(3) to 0.3	Sdev(4) mV	Ratio(4) to 0.3	
0.300	200	N/A	200	N/A	200	N/A	200	N/A	N/A
500.1									0.7

Table 17 : DC 1MΩ, 100 mV/div. Bandwidth Test Record

Trigger Level	Trigger Slope	Channel 1	Channel 2	Channel 3	Channel 4	Lower Limit	Upper Limit
mV		Measured DC Trigger Level (1) mV	Measured DC Trigger Level (2) mV	Measured DC Trigger Level (3) mV	Measured DC Trigger Level (4) mV	mV	mV
0	Pos					–30	+30
0	Neg					–30	+ 30
+300	Pos					+270	+330
+300	Neg					+270	+330
–300	Pos					–270	–330
–300	Neg					–270	–330

Table 18 : Channel DC Trigger Test Record

Trigger Level	Trigger Slope	Channel 1	Channel 2	Channel 3	Channel 4	Lower Limit	Upper Limit
mV		Measured HFREJ Trigger Level (1) mV	Measured HFREJ Trigger Level (2) mV	Measured HFREJ Trigger Level (3) mV	Measured HFREJ Trigger Level (4) mV	mV	mV
0	Pos					–50	+50
0	Neg					–50	+ 50
+300	Pos					+250	+350
+300	Neg					+250	+350
–300	Pos					–250	–350
–300	Neg					–250	–350

Table 19 : Channel HFREJ Trigger Test Record

Trigger Slope	External Trigger Level	External DC	External HFREJ	External Limits		External/10 Trigger Level	External/10 DC	External/10 HFREJ	External/10 Limits	
	mV	Measured DC Trigger Level (Ext) mV	Measured HFREJ Trigger Level (Ext) mV	Lower mV	Upper mV	V	Measured DC Trigger Level (Ext/10) V	Measured HFREJ Trigger Level (Ext/10) V	Lower V	Upper V
Pos	0			–50	+50	0			–0.5	+0.5
Neg	0			–50	+50	0			–0.5	+0.5
Pos	+300			+250	+350	+3			+2.5	+3.5
Neg	+300			+250	+350	+3			+2.5	+3.5
Pos	–300			–250	–350	–3			–2.5	–3.5
Neg	–300			–250	–350	–3			–2.5	–3.5

Table 20 : External & Ext/10 DC and HFREJ Trigger Test Record

Smart Trigger Pulse Width ns	Generator Frequency MHz	Width <	Width >	Triggered	Pass
< 10	100	On	Off	Yes	
< 10	100	Off	On	No	
> 10	40	Off	On	Yes	
> 10	40	On	Off	No	
< 100	10	On	Off	Yes	
< 100	10	Off	On	No	
> 100	4	Off	On	Yes	
> 100	4	On	Off	No	

Table 21 : Smart Trigger Test Record

Generator Frequency MHz	Post Trigger Delay msec	Delay (A) ns	Delay (1) msec	Difference delay(A) –delay(1)+5msec	Lower Limit µsec	Upper Limit µsec
1.00000	5.00000				-0.05	+0.05

Table 22 : Time Base Test Record

Coupling	Measured Channel 1 Over+(A) %	Measured Channel 2 Over+(B) %	Measured Channel 3 Over+(C) %	Measured Channel 4 Over+%(D) %	Overshoot Limit %	Measured Channel 1 Rise(A) ns	Measured Channel 2 Rise(B) ns	Measured Channel 3 Rise(C) ns	Measured Channel 4 Rise(D) ns	Rise time Limit ns
DC 50Ω					0 to 20					0.5
DC 1MΩ					–7 to 20					1.6

Table 23 : Rise time and Overshoot Test Record

DC Reference Source Volt	Measured Channel 1 Overload Trip sec	Measured Channel 2 Overload Trip sec	Measured Channel 3 Overload Trip sec	Measured Channel 4 Overload Trip sec	Measured External Overload Trip sec	Overload Trip Limit sec
7.07						< 17
5.00						> 35

Table 24 : Overload Trip Test Record

6. Maintenance

6.1 Introduction

This section contains information necessary to disassemble, assemble, maintain, calibrate and troubleshoot the LeCroy LC574A, LC574AM & LC574AL digital oscilloscopes.

6.1.1 Safety Precautions

The symbol used in this manual indicates dangers that could result in personal injury.

The symbol used in this manual identify conditions or practices that could damage the instrument.

The following servicing instructions are for use by qualified personnel only. Do not perform any servicing other than contained in service instructions. Refer to procedures prior to performing any service.

Exercise extreme safety when testing high energy power circuits. Always turn the power OFF, disconnect the power cord, discharge the cathode ray tube and all capacitors before disassembling the instrument.

6.1.2 Antistatic Precautions

Any static charge that builds on your person or clothing may be sufficient to destroy CMOS components, integrated circuits, Gate array's.....etc.

In order to avoid possible damage, the usual precautions against static electricity are required.

- Handle the boards in antistatic boxes or containers with foam specially designed to prevent static build-up.
- Ground yourself with a suitable wrist strap.
- Disassemble the instrument at a properly grounded work station equipped with antistatic mat.
- When handling the boards, do not touch the pins.
- Stock the boards in antistatic bags.

6.2 Disassembly and Assembly Procedure

The disassembly and assembly procedures detailed below refer to the views of figures shown in section 8.

6.2.1 Disassembly Procedure

Please study the figures in section 8 before attempting disassembly.
Before removing any parts from the LeCroy LC574A, be sure to read carefully the instructions referring to those parts, noting any precautions needed to avoid problems.

Extreme caution should be taken in protecting the glass CRT face-plate from damage (e.g. scratch marks etc.) when handling, in particular when inserting or removing from the instrument.

a. Removal of the Upper Cover Assembly

The upper cover disassembly procedure refers to the view of figure 8-1.

- Remove three M3X6 screws underneath the plastic bezel.
- Pivot up the plastic bezel and remove it from the front frame by disengaging the hooks on the top of the bezel from the corresponding front frame lugs.

The top cover is secured by seven M3x6 screws on the front panel assembly and by two M5 screws on the rear panel.

- Remove the seven M3X6 screws (three M3X6 on top, two M3X6 on left and two M3X6 on right).
- Remove the two M5 screws that secure the two upper feet on the upper cover and rear panel.
- Carefully slide the upper cover off the unit (disconnect optional Internal printer cables from power supply and processor board).

b. Removal of the Front Frame Assembly with Color Monitor

The front frame disassembly procedure refers to the view of figure 8-2 and 8-10.

- Remove the upper cover assembly (6.2.1.a)
- Remove two M3X6 screws that secure the front frame on both side of the lower cover.
- With a long hex screwdriver unlock two M4X5 screws that secure the monitor on rear of the main board upper shield, and two M3X6 screws that secure the front frame on the main board upper shield.
- Disconnect the monitor VGA cable from the F9601-2 card connector J1
- Disconnect the monitor power cable from the F9601-8 board connector J3

- Disconnect the monitor cable from the external adjustment board.
- Disconnect the floppy cable from the processor board connector J1
- Disconnect the front panel cable from the processor board connector J2

The front frame assembly with monitor, front panel and floppy disk drive can with care be removed forward from the unit.

c. Removal of the Processor Board

The processor board disassembly procedure refers to the view of figure 8-1 & 8-20.

- Remove the upper cover assembly (6.2.1.a)
- Remove the front frame assembly (6.2.1.b)
- Disconnect the processor cable J10 from the F9601-2 card connector J4
- Disconnect the processor cable J9 from the F9300-4 RS232 & GPIB interface and optional F9300-8 hard disk interface.

The processor can now be removed vertically from the main board connector J1.

d. Removal of the Power Supply Assembly

The power supply disassembly procedure refers to the view of figure 8-3 & 8-20.

- Remove the upper cover assembly (6.2.1.a)
- Remove the front frame assembly (6.2.1.b)
- Remove the processor board (6.2.1.c)

If the instrument is equipped with hard disk option, remove the F9300-8 interface from the rear panel, by removing two M3X6 screws that secure it to the rear panel.

- Remove two M3X6 screws that secure the power supply on the main board upper shield.
- Remove two M3X6 screws that secure the power supply on the rear panel.
- Disconnect the power supply cable from the F9601-8 board connector J2
- Disconnect the fan power cable from the power supply connector J5
- Disconnect the power supply cable from the F9654-32 main board connector J2

The power supply can now be removed from the oscilloscope.

e. Removal of the Upper Shield Assembly

The upper shield disassembly procedure refers to the view of figure 8-4.

- Remove the upper cover assembly (6.2.1.a)

- Remove the front frame assembly (6.2.1.b)
- Remove the processor board (6.2.1.c)
- Remove the power supply (6.2.1.d)

- Remove twelve M3x20 screws that secure the shield to the lower cover.
- Remove six M3X5 screws on both side of the lower cover.
- Remove six M2.5x6 screws that secure the upper shield to the main board front panel.
- Remove three M3X6 screws that secure the upper shield to the rear panel.
- Disconnect the power cable from the F9601-8 board connector J1.

The upper shield can now be removed from the oscilloscope.

f. Removal of the Rear Panel Assembly

The rear panel disassembly procedure refers to the view of figure 8-5.

- Remove the upper cover assembly (6.2.1.a)
- Remove the front frame assembly (6.2.1.b)
- Remove the processor board (6.2.1.c)
- Remove the power supply (6.2.1.d)
- Remove the upper shield (6.2.1.e)

- Remove two M5 screws that secure the two lower feet to the rear panel and lower cover.

The rear panel assembly can now be removed from the oscilloscope.

g. Removal of the Main Board Assembly

The main board disassembly procedure refers to the view of figure 8-7 & 8-8.

- Remove the upper cover assembly (6.2.1.a)
- Remove the front frame assembly (6.2.1.b)
- Remove the processor board (6.2.1.c)
- Remove the power supply (6.2.1.d)
- Remove the upper shield (6.2.1.e)
- Remove the rear panel (6.2.1.f)

- Remove the two acquisition memories
- Remove twelve M3x6 screws that secure the main board to the lower cover.
- Remove three M3X6 standoffs that secure the main board to the lower cover.

The main board can now be removed from the oscilloscope.

6.2.2 Assembly Procedure

Reassemble the unit in the reverse order, check that all screws shown on the drawings in section 8 are used and properly torqued.
Verify that all cables are correctly connected.

Assembly Note :

- **Bezel** : The plastic bezel should be in contact with the CRT all around the screen area. The bezel should not be deformed.
  Adjust to 1.5 mm wide the joint between the bezel and the upper cover.

- **Color Monitor** : Being careful not to damage the protective ground braid.

- **Fan** : Check the fan cable direction. Note the air flow, the fan extracts air from the unit and expels it.

- **Feet** : Check that the lower feet and rear feet are aligned and properly tightened before re-assembly.

- **Filter** : Check that the earth wire is correctly installed and tightened.

- **Floppy** : Adjust the floppy position to obtain the front face tangential to face of the front panel. Check that the door is moving freely and shuts correctly.
  Insert a floppy and eject it to check the mechanism.

- **Front Panel** : Check that knobs rotate freely, are the right size and in the right place.

- **Main Board** :The main card must be parallel and tacked against the bend of the lower cover. Being careful not to bend the board or damage components underneath. The main board must be programmed for the correct memory size. This can only be performed at a factory authorized service center.

- **Rear Panel** : Check the CD9610 trimming adjustments are aligned with the holes in the rear panel.

- **Processor** : Check that the memory card insertion guide is correctly inserted in the front panel.

- **Power supply** : Extend the power supply cable to connect it to the main board.

- **Printer** : If the graphic printer is used, before closing don't forget to plug the input cable to the option and the driver cable to the processor card.

6.3 Software Update Procedure

6.3.1 Upgrading Firmware

LeCroy Corporation has a policy of continually improving and upgrading its products.

The LC574A instrument is equipped with flash Prom on processor board. The software is updated to the latest version using either the floppy disk drive or the memory card interface.

After any software change, reboot the scope or perform a general reset of the instrument by simultaneously depressing the autosetup button, the top menu button and the return button.

To update an LC574A scope from software version earlier than 7.1.0, first update to 7.1.0, then proceed to update as described below.

6.3.1.1 Firmware Update Procedure from Floppy

a. Creating the Disk

- Format a single high density 1.44Mb floppy in the scope (not in the PC)
- Create a directory LECROY_P in the root of the card
- Copy the file LCXXX7XX.FLA, into the directory created above.
- Label this disk " Firmware Update Disk "

b. Performing the Update from Floppy

- Cycle power to the scope with no floppy or card inserted.
- When the scope boots enter the "Show Status" , "System" menu to verify that version 7.1.0 or later is running.

- Insert the Firmware Update Disk into the scope's floppy drive.
- Select "Utilities", "Special Modes", "Firmware Update", "Update from Floppy" .
- Press twice "Update Flash".

- When the operation is complete remove the floppy and reboot the scope.
- When the scope boots enter the "Show Status", "System " menu to verify that version 7.X.X is currently running.

6.3.1.2 Firmware Update Procedure from Memory Card

a. Creating the Update Card

- Follow the above procedure to update FLASH to 7.X.X from a Floppy Disk.
- Enter the "Internal Diagnostics Menu" by simultaneously pressing the Third and Fourth menu push buttons on the right hand side of the CRT, then release them, and then press the Fifth.
- Select "Flash Update" and use "Xfer Flash to Card" option to create the card. This card will not be readable in a PC since it will not contain a standard DOS file system.

b. Performing the Update from Card

- Cycle power to the scope with no floppy or card inserted.
- When the scope boots enter the "Show Status" , "System" menu to verify that version 7.1.0 or later is running.
- Insert the Card created above into the PCMCIA Slot.
- Select "Utilities", "Special Modes", "Firmware Update", "Update from Card" .
- Press twice "Update Flash".
- When the operation is complete remove the card and reboot the scope.
- When the scope boots enter the "Show Status", "System " menu to verify that version 7.X.X is currently running.

6.3.2 Changing Software Options

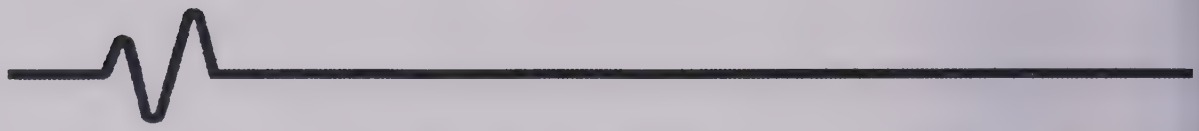
The Software option's selection GAL is located on the processor board at location A48. Insert or replace the GAL to select new options.
Make sure that the orientation notch is correctly aligned with the PCB.

6.3.2.1 Software Option Selection GAL

The following software options are available:

- WP01 Advanced Math Firmware
- WP02 Basic FFT Firmware
- WP03 Parameter Distribution Analysis Firmware

- DDM Disk Drive Measurements
- PRML Partial Response Maximum Likelihood
- ORM Optical Recording Measurement
- DDFA Disk Drive Failure Analysis
- MC01 PCMCIA Memory Card
- MT01/02 Automatic Mask Tester



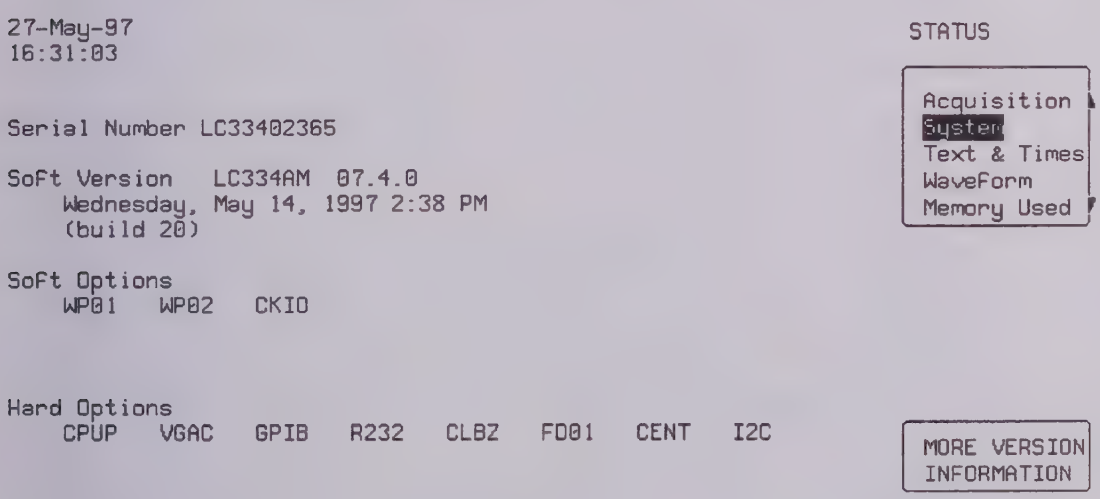
MC01 200	DDFA 080	ORM 040	PRML 020	DDM 008	WP03 004	WP02 002	WP01 001	KEY XXX-R XXX = Software option,
no	no	no	no	no	no	no	no	GAL Not Necessary
no	no	no	no	no	no	no	**yes**	**KEY 001-A**
no	no	no	no	no	no	**yes**	no	**KEY 002-A**
no	no	no	no	no	no	yes	yes	KEY 003-A
no	no	no	no	no	**yes**	no	no	**KEY 004-A**
no	no	no	no	no	yes	no	yes	KEY 005-A
no	no	no	no	no	yes	yes	no	KEY 006-A
no	no	no	no	no	yes	yes	yes	KEY 007-A
no	no	no	no	**yes**	no	no	no	**KEY 008-A**
no	no	no	no	yes	no	no	yes	KEY 009-A
no	no	no	no	yes	no	yes	no	KEY 00A-A
no	no	no	no	yes	no	yes	yes	KEY 00B-A
no	no	no	no	yes	yes	no	no	KEY 00C-A
no	no	no	no	yes	yes	no	yes	KEY 00D-A
no	no	no	no	yes	yes	yes	no	KEY 00E-A
no	no	no	no	yes	yes	yes	yes	KEY 00F-A
no	no	no	**yes**	no	no	no	no	**KEY 020-A**
no	no	no	yes	no	no	no	yes	KEY 021-A
no	no	no	yes	no	no	yes	no	KEY 022-A
no	no	no	yes	no	no	yes	yes	KEY 023-A
no	no	no	yes	no	yes	no	no	KEY 024-A
no	no	no	yes	no	yes	no	yes	KEY 025-A
no	no	no	yes	no	yes	yes	no	KEY 026-A
no	no	no	yes	no	yes	yes	yes	KEY 027-A
no	no	no	yes	yes	no	no	no	KEY 028-A
no	no	no	yes	yes	no	no	yes	KEY 029-A
no	no	no	yes	yes	no	yes	no	KEY 02A-A
no	no	no	yes	yes	no	yes	yes	KEY 02B-A
no	no	**yes**	no	no	no	no	no	**KEY 040-A**
no	no	yes	no	no	no	no	yes	KEY 041-A
no	no	yes	no	no	no	yes	no	KEY 042-A
no	no	yes	no	no	no	yes	yes	KEY 043-A
no	**yes**	no	no	no	no	no	no	**KEY 080-A**
no	yes	no	no	no	no	no	yes	KEY 081-A
no	yes	no	no	no	no	yes	no	KEY 082-A
no	yes	no	no	no	no	yes	yes	KEY 083-A
....✂....	....✂....	....✂....	....✂....	....✂....	....✂....	....✂....	....✂....	.....✂.....
yes	no	no	no	no	no	no	no	**KEY 200-A**
yes	no	no	no	no	no	no	yes	KEY 201-A
yes	no	no	no	no	no	yes	no	KEY 202-A
yes	no	no	no	no	no	yes	yes	KEY 203-A
yes	no	no	no	no	yes	no	no	KEY 204-A
yes	no	no	no	no	yes	no	yes	KEY 205-A
yes	no	no	no	no	yes	yes	no	KEY 206-A
yes	no	no	no	no	yes	yes	yes	KEY 207-A
yes	no	no	no	yes	no	no	no	KEY 208-A
....✂....	....✂....	....✂....	....✂....	....✂....	....✂....	....✂....	....✂....	.....✂.....
yes	yes	yes	yes	yes	yes	yes	yes	KEY 2EF-A

6.3.3 Processor Board Exchange Procedure

The replacement board is supplied without any options. Therefore the existing GAL (Loc. A48) must be transferred from the faulty board to the new board. After upgrading firmware or changing the software option, check that the scope boots correctly. Then check in the system summary, by using the show status button on the front panel, the software version, software options and serial number.

The serial number of the LC574A oscilloscope is loaded in the real time clock memory which is battery backed up. If it becomes necessary to replace the processor board, the serial number must be loaded in the memory of the new board by using LeCroy program " LeCalsoft " under GPIB remote control.

To run " LeCalsoft " type SKP.exe, in the main menu type S, and follow the instructions, use five digits to enter the serial number (i.e. 02365).



6.4 Equipment and Spare Parts Recommended for Service

6.4.1 Test Equipment Required

See Table 5-1 in section 5.2.

6.4.2 LC574A, LC574AM and LC574AL Spare Parts

LeCroy P/N	Assembly	Adjustments	Performance Tests
F9601-1-8	Power PC, 2X4MB DRAM for LC574A & LC574AM	None	None
F9601-1-64	Power PC, 2X32MB DRAM for LC574AL	None	None
F9601-2	Internal + External VGA Centronics Interface	None	None
9384M-2	Acquisition Memory 2X500k for LC574A & AM	None	None
9384MEM-2	Acquisition Memory 2 x 2M for LC574AL	None	None
F9384-31	Acquisition Card	6.5.2	Chapter 5
F9354-4	Timebase Board	None	Chapter 5
F9300-4	GPIB Interface RS232 Interface	None	None
FP9604	Front Panel Assy 4 Channel	None	None
F9602-5	Keypad	None	None
F9604-5	Front Panel	None	None
F9601-6	Floppy Disk Drive Assy	None	None
F9300-7	Printer Interface	None	None
F9300-8	Hard Disk Interface	None	None
F9601-8	Main Switch Board	None	None
CD9610	CD9600 10"Color Display, VGA 640 x 480 points with Magnetic Cancellation Coil.	6.5.3	None
PSLC574	Power Supply LC574	6.5.1	None
900024	Power Supply LC574 w/Fan	6.5.1	None

The other parts are not on the above list because the probability of failure is very low.

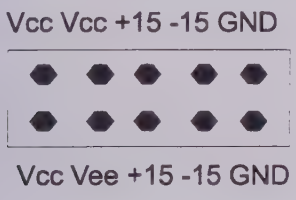
See chapter 7, 8 & 9 for mechanical and electrical replaceable parts.

6.5 Calibration Procedures

The following section includes the manual adjustments of the power supply, front end acquisition board and color monitor, but does not contain any calibration instructions about the Analog to Digital Converter.
The ADC adjustments require complex test set-up and calibration Software.

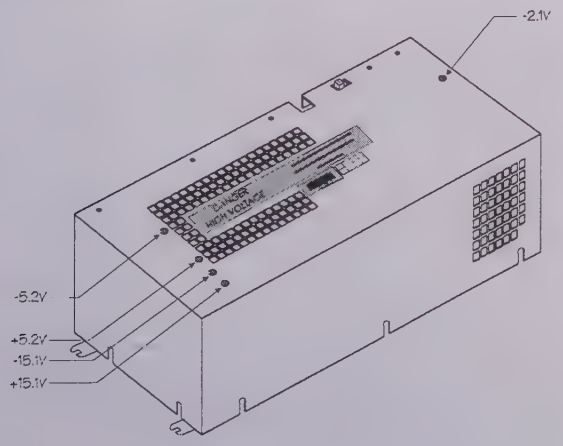
6.5.1 Power Supply Calibration Procedure

- Remove the upper cover assembly (see 6.2.1.a)
- To ensure adequate main board cooling, it is necessary to control the air flow by installing a **temporary closure plate** which fully encloses the air space behind the monitor.
- Turn on the power, set the scope to **Auto Trigger**, and perform the adjustments to get on processor board connector J11:



Vcc	: **- 5.2 VDC**	(Min - -5.30 V, Max = -5.10 V)
Vee	: **+ 5.2 VDC**	(Min - +5.10 V, Max = +5.30 V)
+15	: **- 15.1 VDC**	(Min - +5.05 V, Max = +15.15 V)
-15	: **+ 15.1 VDC**	(Min - -15.15 V, Max = -15.05 V)
-2	: **- 2.1 VDC**	(Min - -2.15 V, Max = -2.05 V)
+3.3	: **+ 3.3 VDC**	(Min - +3.25 V, Max = +3.35 V) not adjustable

The five potentiometers are accessible from the top through holes in the 900024 power supply chassis.



- Turn the potentiometer clockwise to increase the voltage or counterclockwise to decrease it. When the adjustment is done, stop the acquisition by depressing the stop trigger push button, and verify that there is no large difference on the + 5.00 V, typically less than 80 mV.

6.5.2 Color Monitor Calibration Procedure

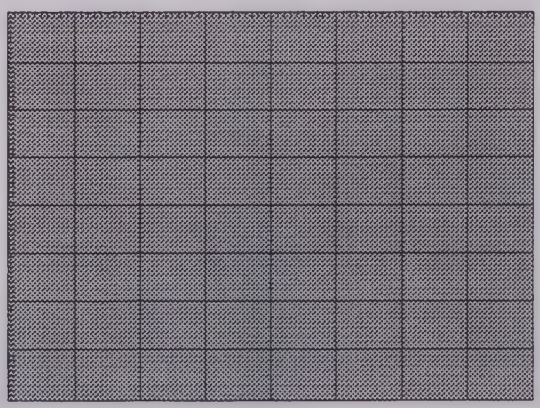
This procedure describes the adjustments for the CD9610 display used in the LC574A series digital storage oscilloscopes.

For reasons of operator safety, no internal part of the display should be touched directly or accessed with any metallic object. All internal safety warning labels should be observed closely.
Any internal display adjustment should be performed using non-magnetic, insulated adjustment tools.
The display system should be oriented on the test bench so the CRT neck is facing magnetic west.
The tests should be performed well away from sources of magnetic radiation. If in doubt, the screen image should be observed for any change whilst the source of potential magnetic radiation is switched on/off (e.g. PC Monitor). If any change is visible on geometry or other effects, the setup environment is unsuitable.

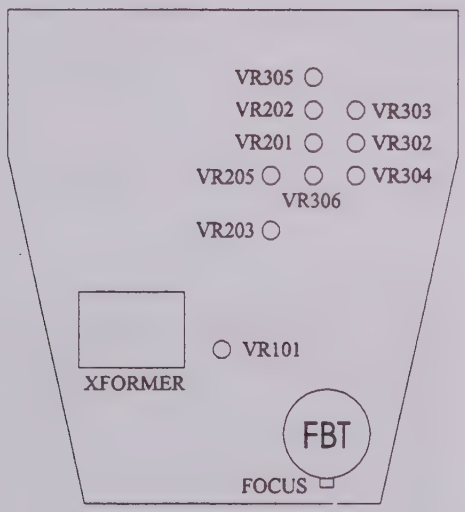
a. Adjustment of Screen Image Position and Size

- Enter the internal menus by pressing menu soft-keys 3 & 4, then release them, then press soft-key 5.
- Select "**Maintenance**", "**Screen Test**", "**Test Images**"
- Select screen test image CD3 by rotating the Time/Div front panel control.

CD96xx Test Grate 3



- Adjust **VPOS** and **VSIZE** controls on the external adjustment board to nominally centre the screen image vertically and obtain a vertical size of 125 mm ± 0.5mm where there is approximately 5mm at the top and bottom between the test image area and the front panel bezel.



Position of Adjustment Potentiometers on Main Circuit Board

Adjustment	Purpose	Comments
VR101	Power Supply Adjust	Do Not Adjust
VR201, 202	Horizontal Phase	Do Not Adjust
VR203	Horizontal Position	Adjustable on external adjustment board
VR205	Horizontal Synchronization	Do Not Adjust
VR302	Vertical Size	Adjustable on external adjustment board
VR303	Trapezium	Adjust if required
VR305	Pin-Cushion	Adjust if required
VR304	Vertical Linearity	Adjust if required
VR306	Horizontal Size	Adjust if required
Focus	Focus	Adjust if required

- Remove the upper cover of display by removing the 9 retaining screws.

- Adjust **HSIZE VR306** control on the main board to obtain a horizontal width of 170mm +3.00mm, -7.00mm.

note: the addition of the CD9610-2 cancellation coil assembly has the effect of reducing the screen width by approximately 4mm.

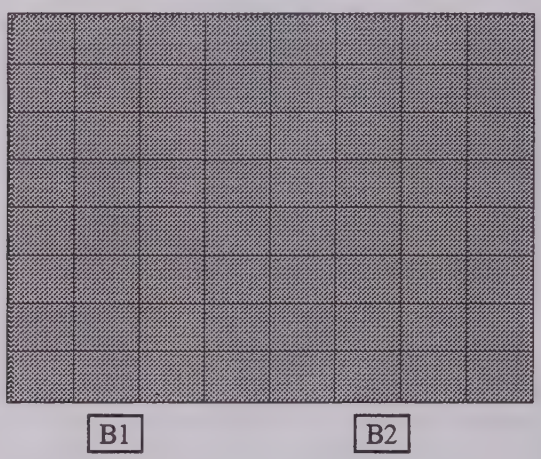
- Adjust **HPOS** control on the external adjustment board to center the screen image horizontally and to obtain a distance at either side of the screen image to the bezel of 2mm.

b. Image Rotation Adjustment Procedure

This procedure is carried out by aligning the CRT within the display chassis.

Note: The rotation of the deflection yoke on the CRT neck should not be attempted as it affects significantly the convergence adjustment of the screen.

CD96xx Test Grate 3



- Loosen the 4 CRT retaining screws, being careful not to damage the protective ground braid.

- Rotate the CRT within the chassis to obtain the optimal alignment of the screen test image reference points B1 and B2 within the bezel.
  distance B1 to bezel - distance B2 to bezel | <= 1.0 mm

- The 4 CRT mounting lugs should not be allowed to protrude outside the overall CRT chassis sides and bottom or above the CRT chassis top cover.

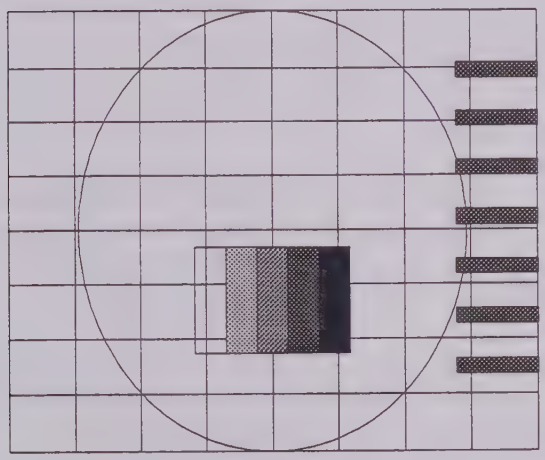
- Tighten the 4 CRT retaining screws.

c. Vertical Linearity

- Select screen test image **CD4** (Magenta Grid on black background) by rotating the Time/Div front panel control.

- Adjust the **VPOS** and **VSIZE** controls to optimize the screen vertical size and position such that the best alignment is obtained of the soft-key menu markings on the bezel and the gray menu control markings on the screen of test image CD4.

CD96xx Test Grate 4



- Verify that the menu markings (each of the 7) on the bezel are aligned horizontally within +- 1.0 mm with the corresponding markings on the screen test image.

d. Control of Screen Image Quality

- Adjust the **Brightness** control on the external adjustment board until the gray-scale test bars on test image CD4 are evenly balanced in color graduation from White to Black. The Black bar (right hand side) should be easily distinguishable from the adjacent bar of dark gray.

- Adjust the **Contrast** on the external adjustment board and **Focus** on the main board until the image is of good quality.

- Verify that there is no jitter of the grid lines (X or Y), the background color is gray and is uniform:
  - No Black holes
  - No color (rainbow) variation
  - No Moiré fringe (wavy lines) visible within the gray background

e. Trapezium & Pin Cushion Adjustment Procedure

- Select screen test image CD3 by rotating the Time/Div front panel control
- Adjust the Trapezium / Pin-Cushion effect using Potentiometers **VR305** and **VR303** (toward the front left of the bottom PCB within the display assembly) until the minimum distortion is achieved.

6.6 Troubleshooting and Flow Charts

6.6.1 Introduction

The troubleshooting information contained in this section is intended for use by qualified personnel having a basic understanding of electronics (analog and digital). In order to simplify servicing and minimize downtime, the following list of possible symptoms, likely causes, and troubleshooting steps have been prepared.
The first step in troubleshooting is to check for obvious items like blown fuses. The power supply is the next item to check before proceeding to more detailed troubleshooting, since noise or low power supply voltages can cause a variety of digital and analog problems.

6.6.2 Line Fuses Replacement

The power supply of the oscilloscope is protected against short circuits and overload by means of two T6.3A / 250 V fuses located above the main plugs.

Turn off the power and disconnect the line cord from the instrument
Disconnect the instrument from other equipment.

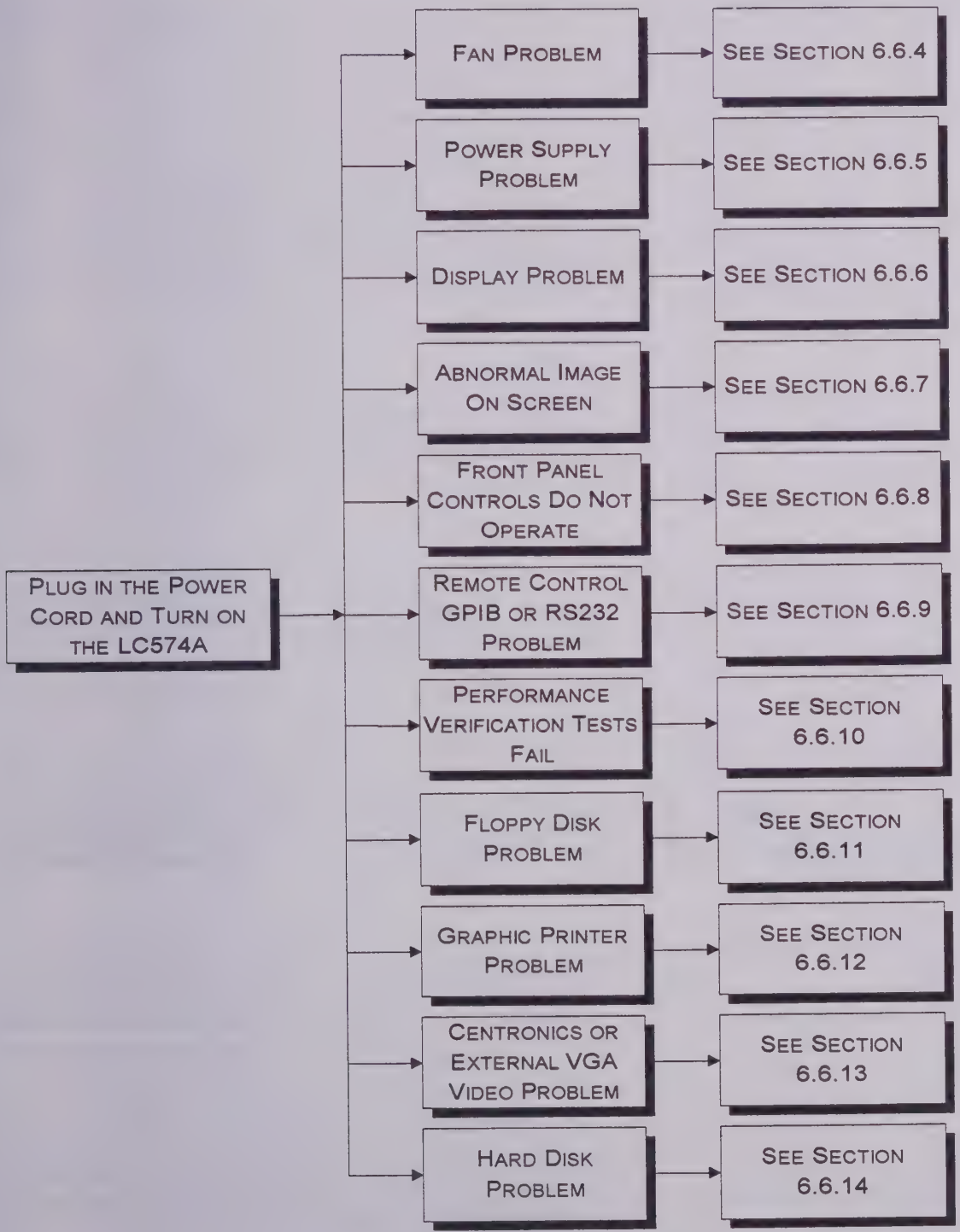
To replace line fuses, proceed as follow :

- Open the fuse box by inserting a small flat screwdriver under the plastic cover and remove the fuse carrier from the holder
- Remove the fuse and replace it with the proper type: T6.3 A / 250 V, LeCroy part number: **433 162 630**

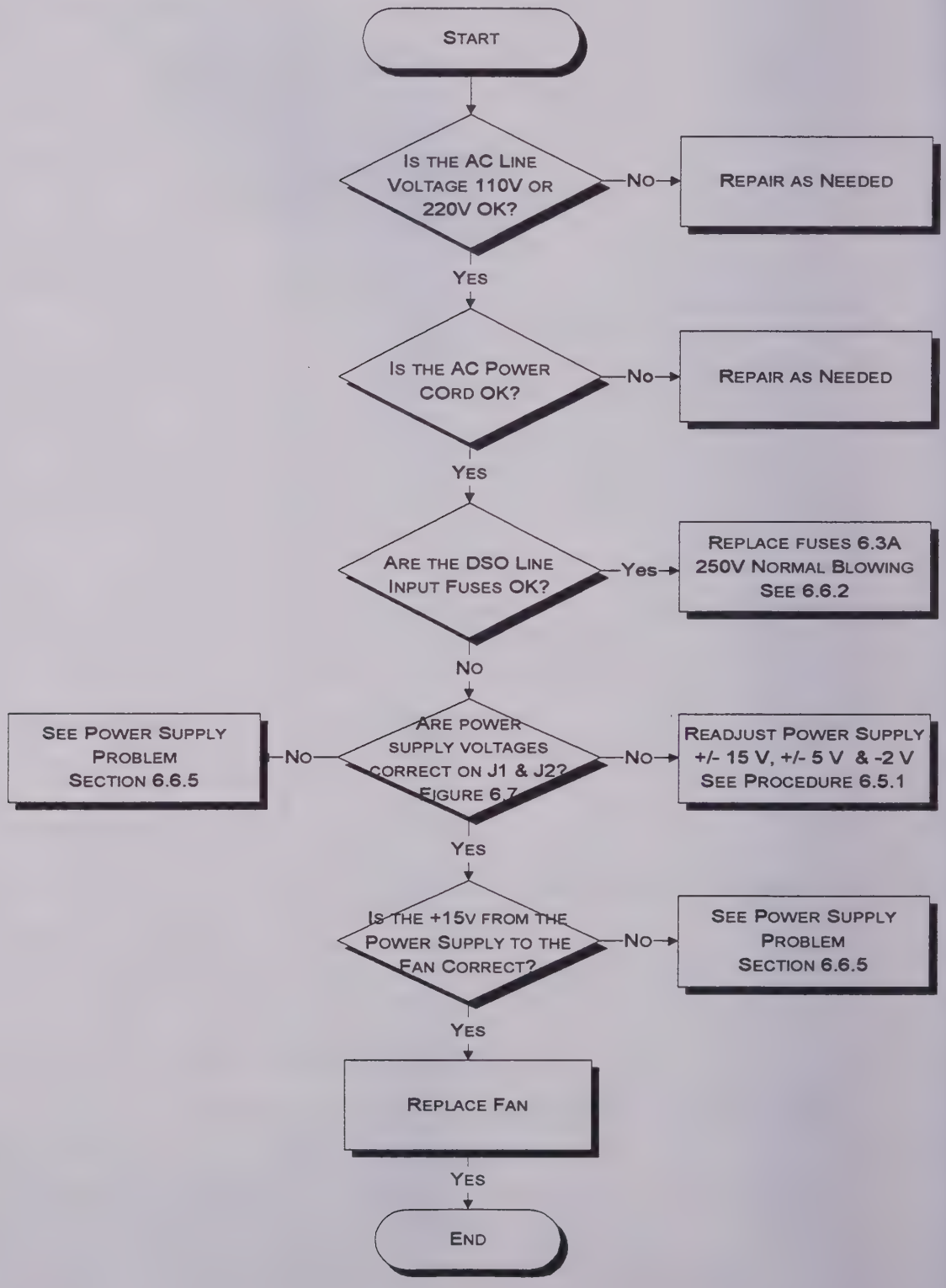
6.6.3 Initial Troubleshooting Chart

Most procedures in this section will allow troubleshooting down to the **BOARD LEVEL.**

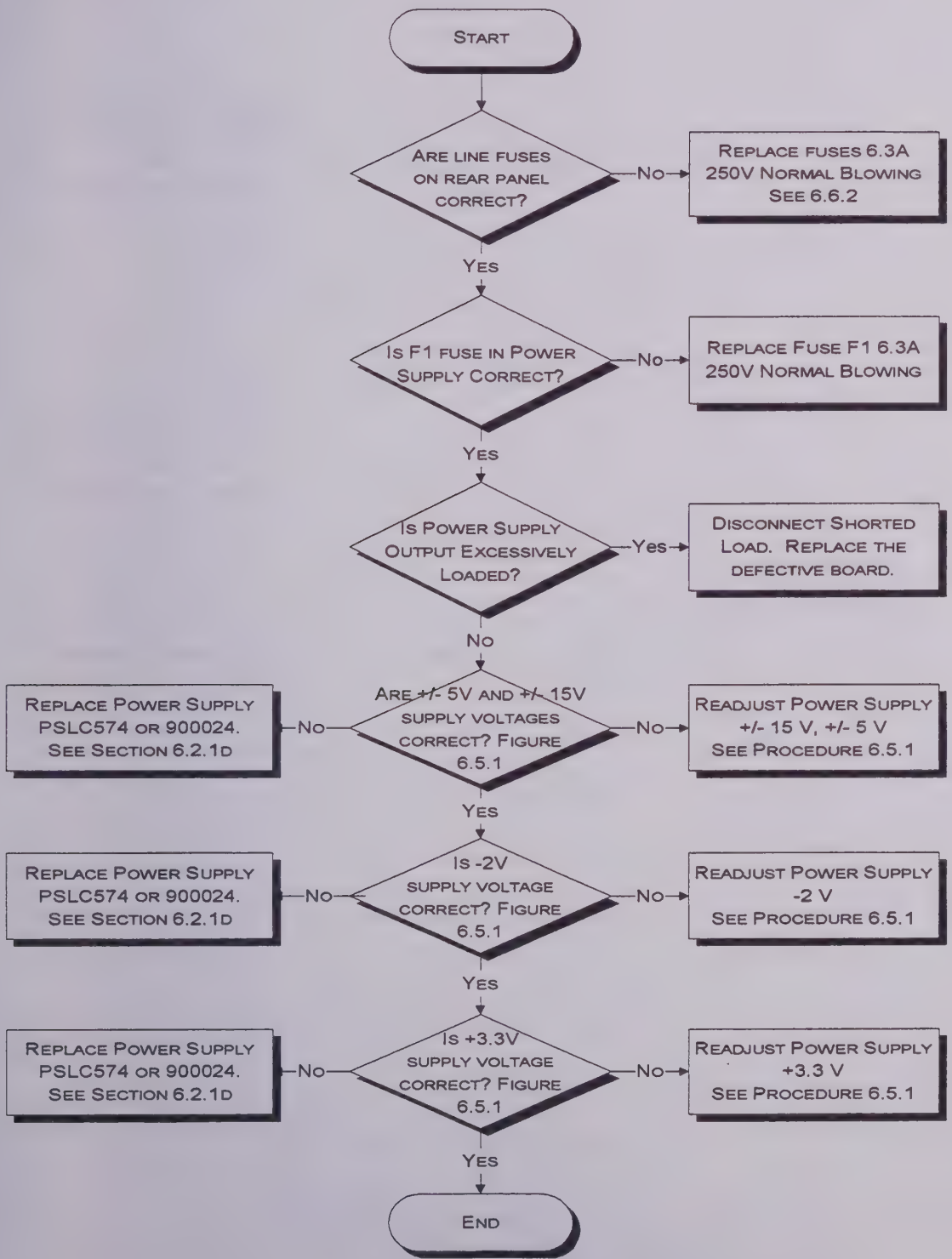
Defective circuit boards will be repaired or exchanged by the regional LeCroy service office or the local representative (see section 2.2).


Plug in the Power Cord and Turn on the LC574A
Fan Problem
See Section 6.6.4
Power Supply Problem
See Section 6.6.5
Display Problem
See Section 6.6.6
Abnormal Image On Screen
See Section 6.6.7
Front Panel Controls Do Not Operate
See Section 6.6.8
Remote Control GPIB or RS232 Problem
See Section 6.6.9
Performance Verification Tests Fail
See Section 6.6.10
Floppy Disk Problem
See Section 6.6.11
Graphic Printer Problem
See Section 6.6.12
Centronics or External VGA Video Problem
See Section 6.6.13
Hard Disk Problem
See Section 6.6.14

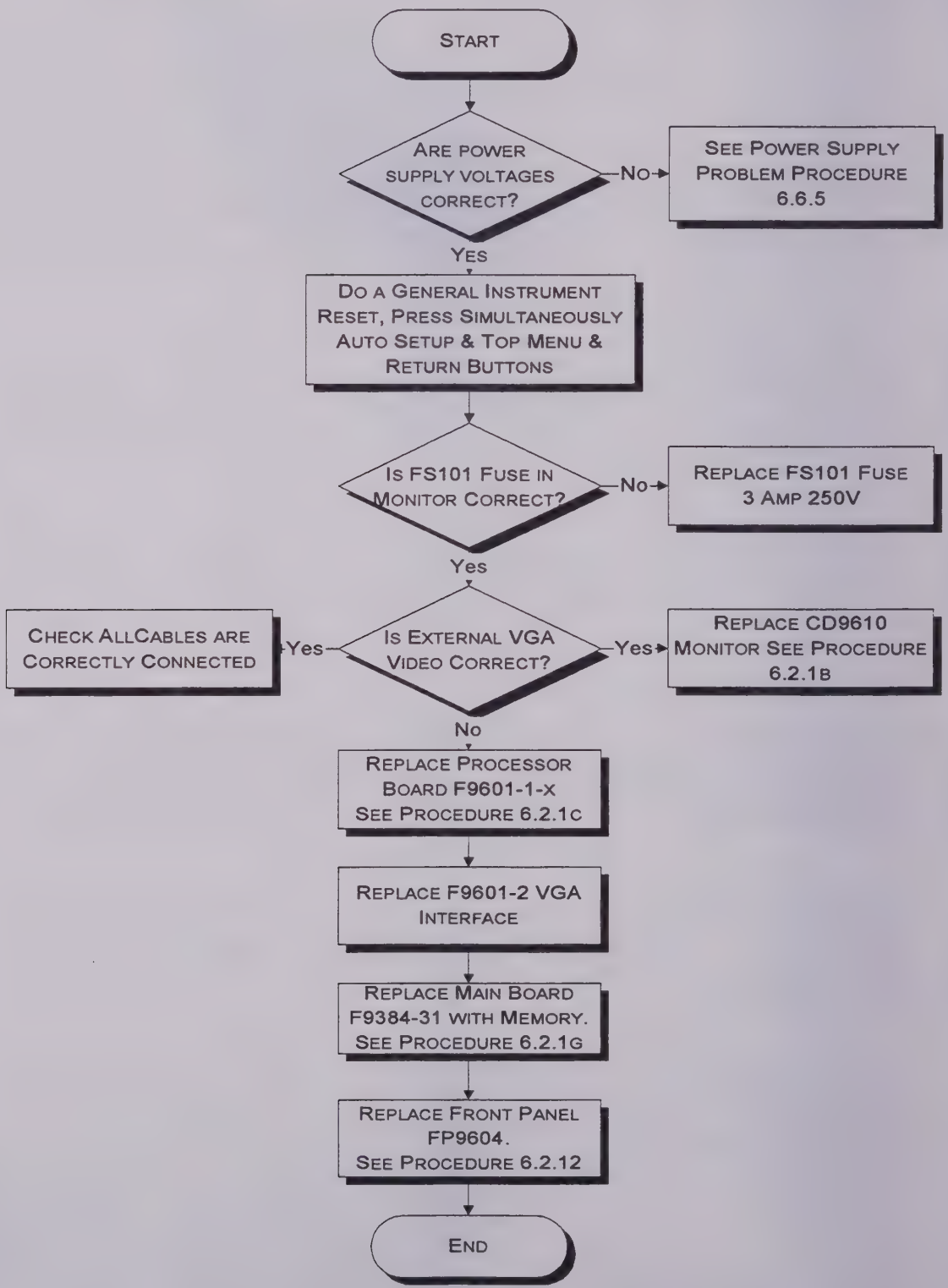
6.6.4 Fan Problem



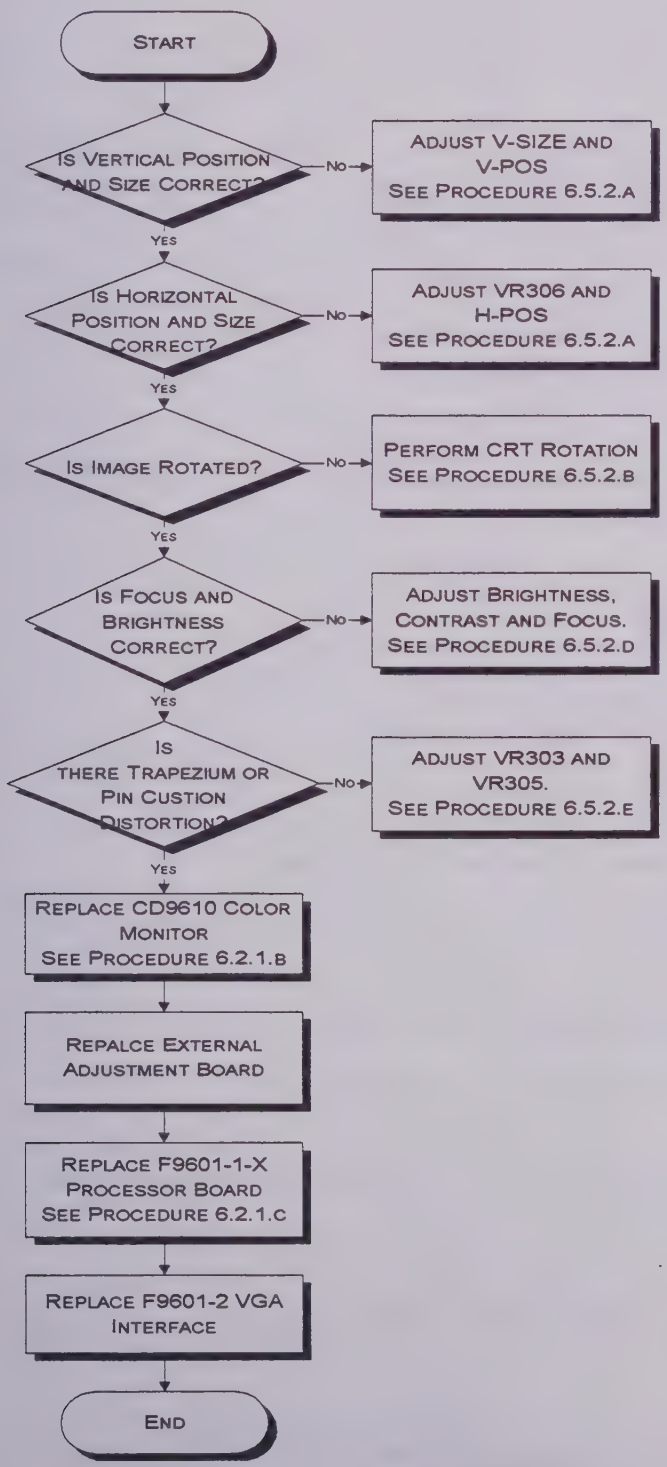
6.6.5 Power Supply Voltages Problem



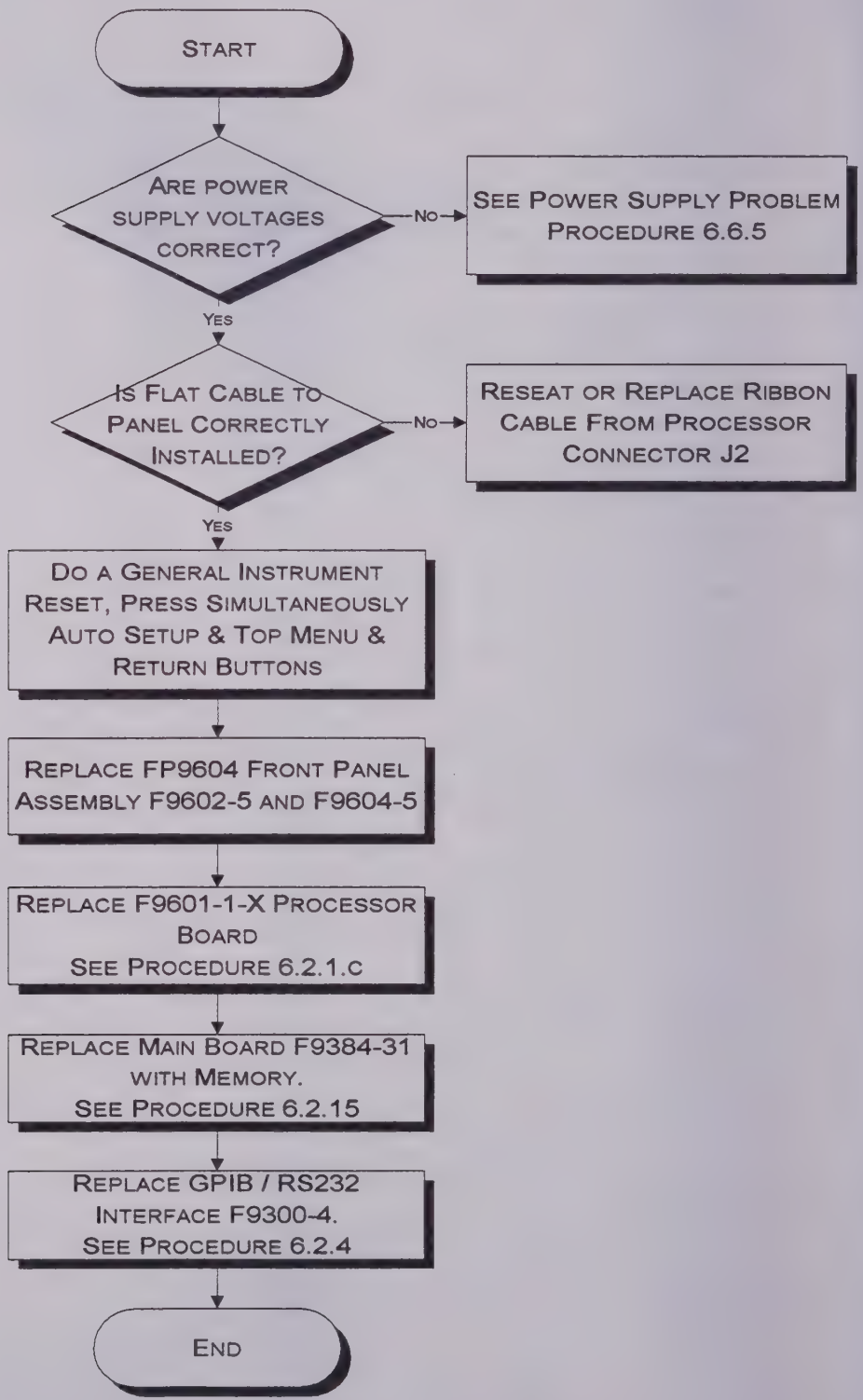
6.6.6 Display Problem



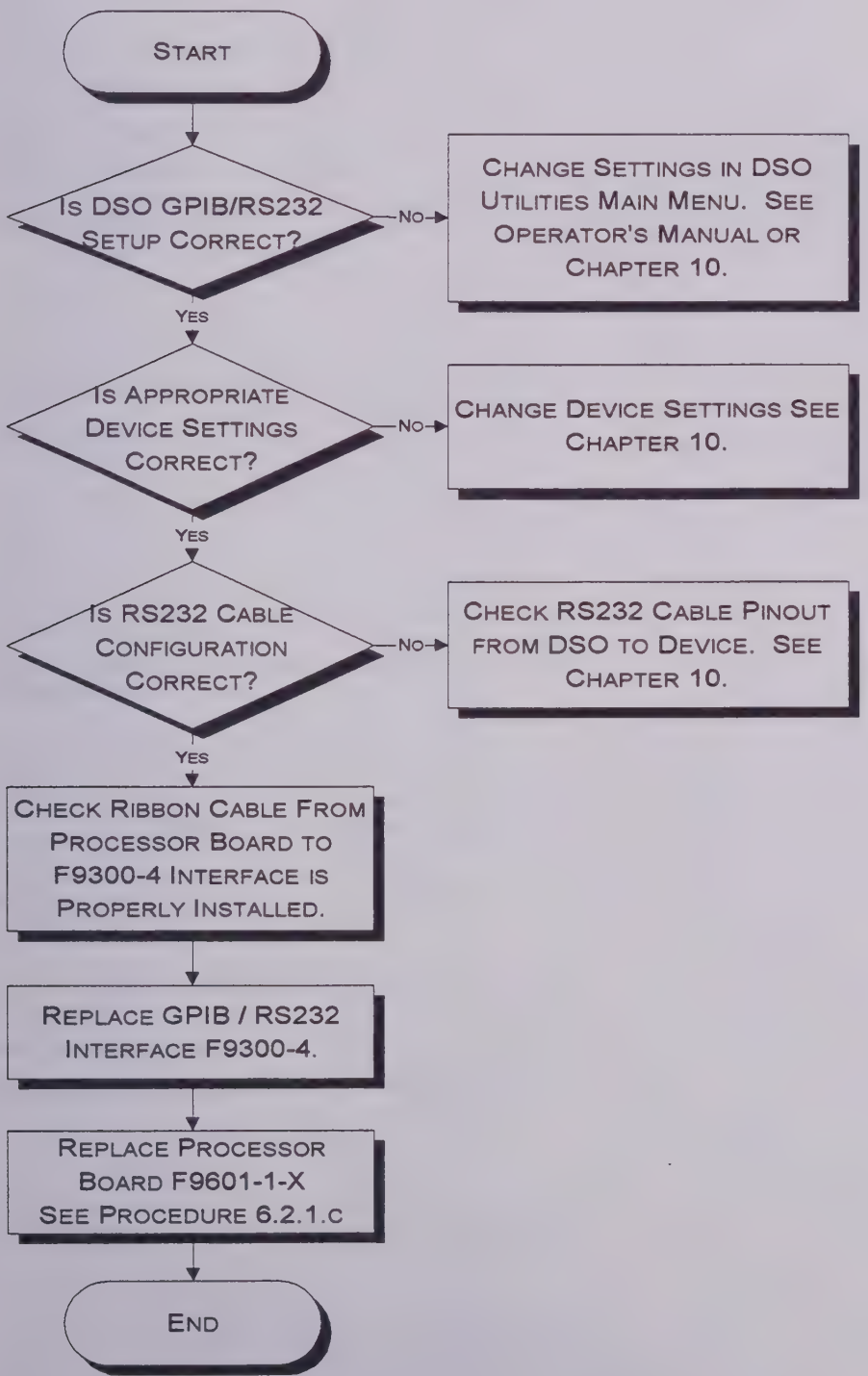
6.6.7 Abnormal Image On Screen



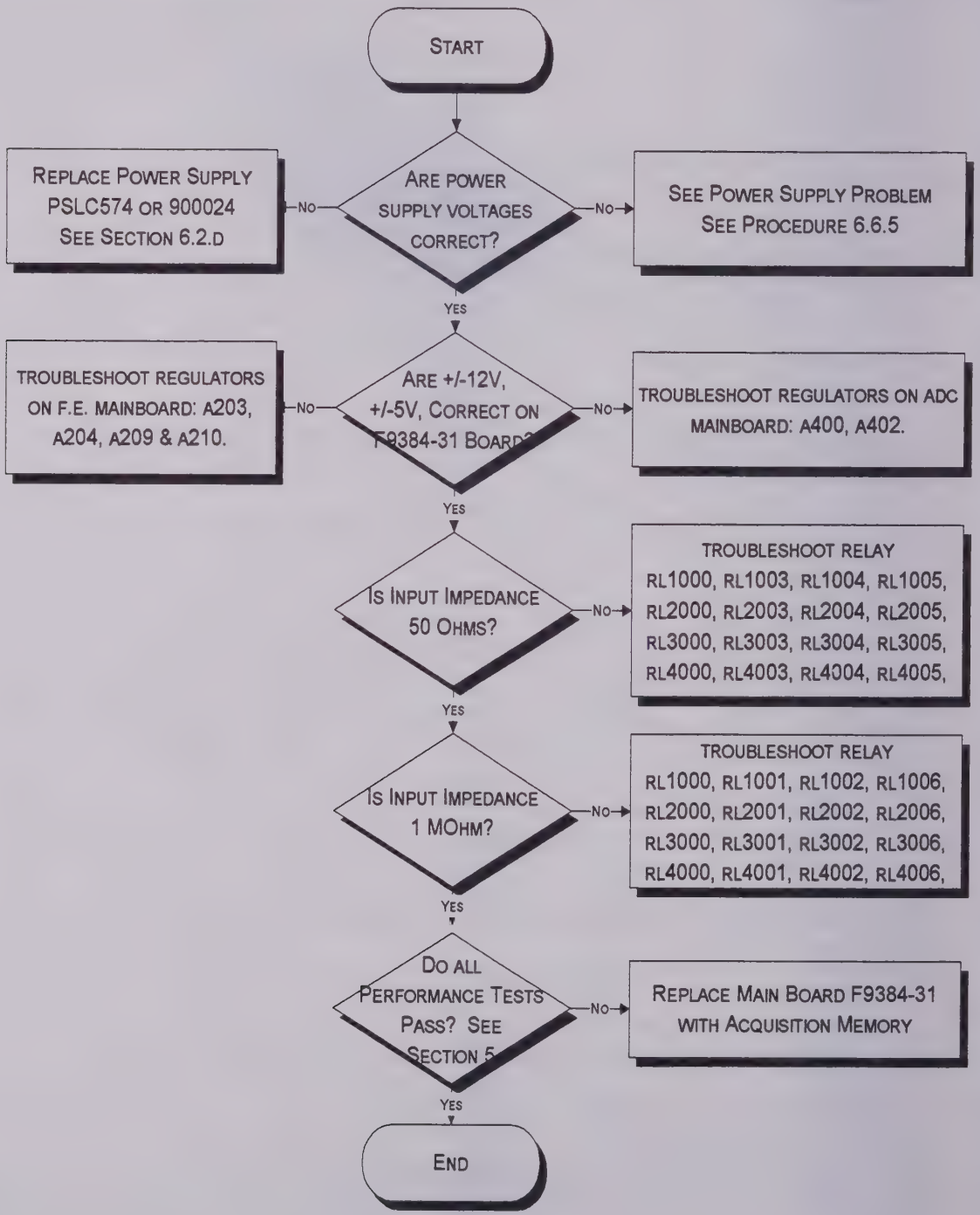
6.6.8 Front Panel Controls Do not Operate



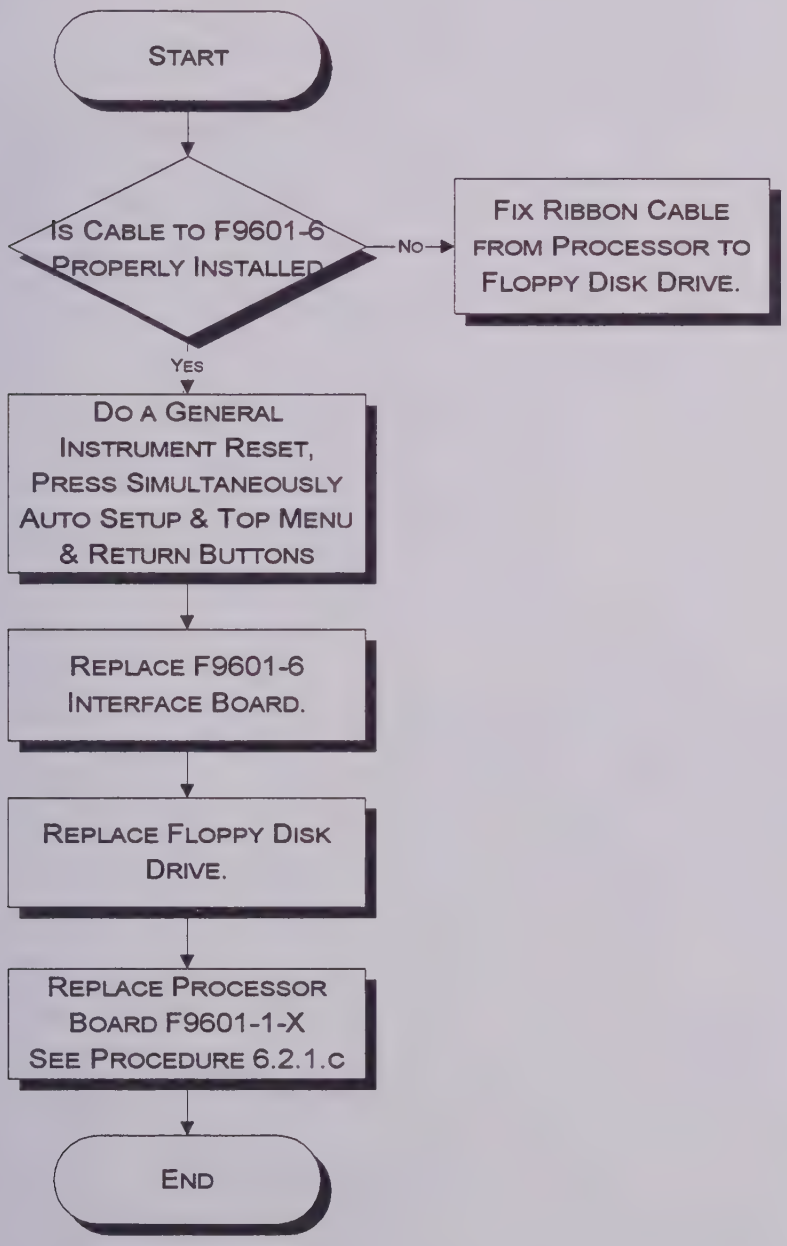
6.6.9 Remote Control GPIB or RS232 Problem



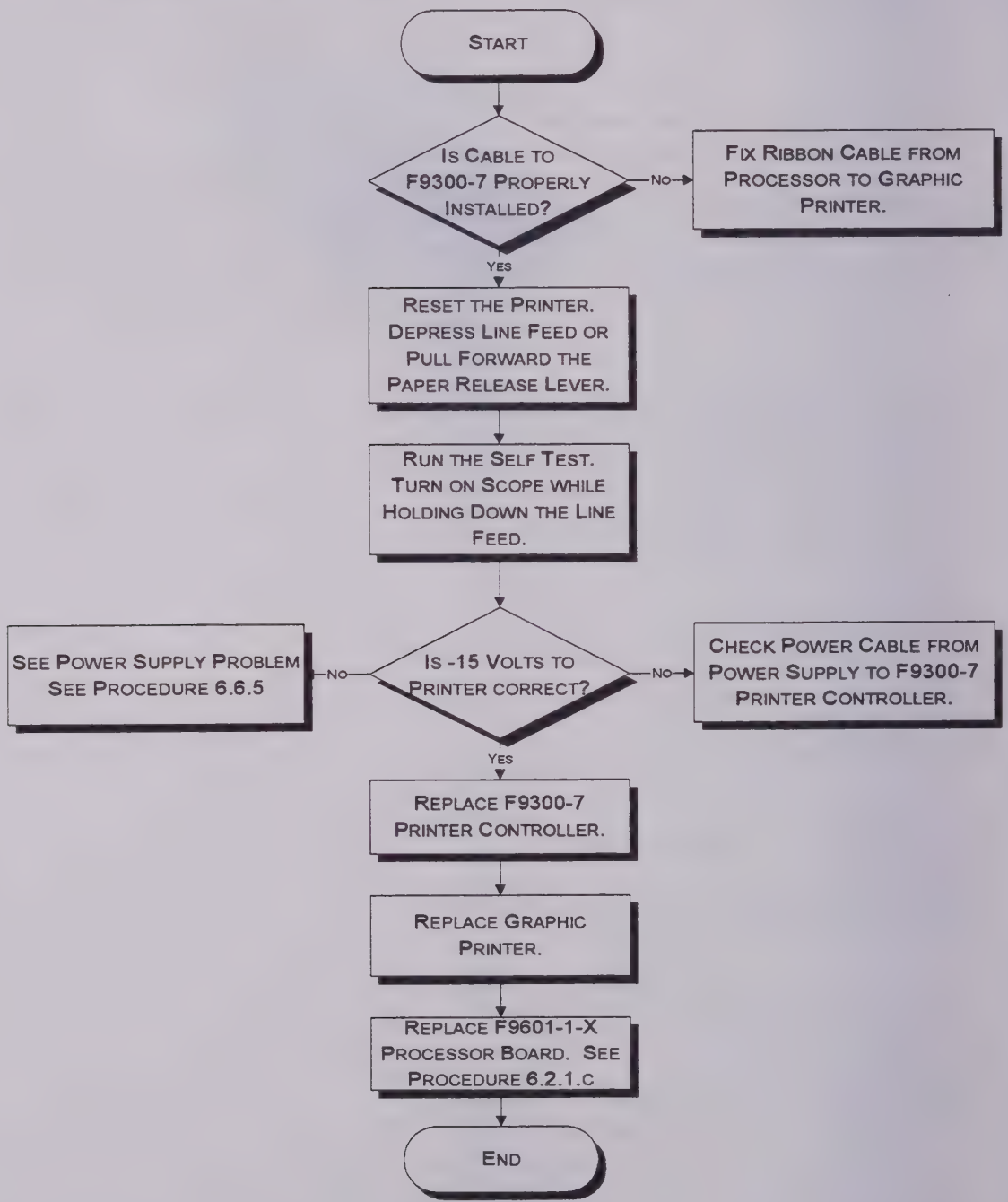
6.6.10 Performance Verification Fails



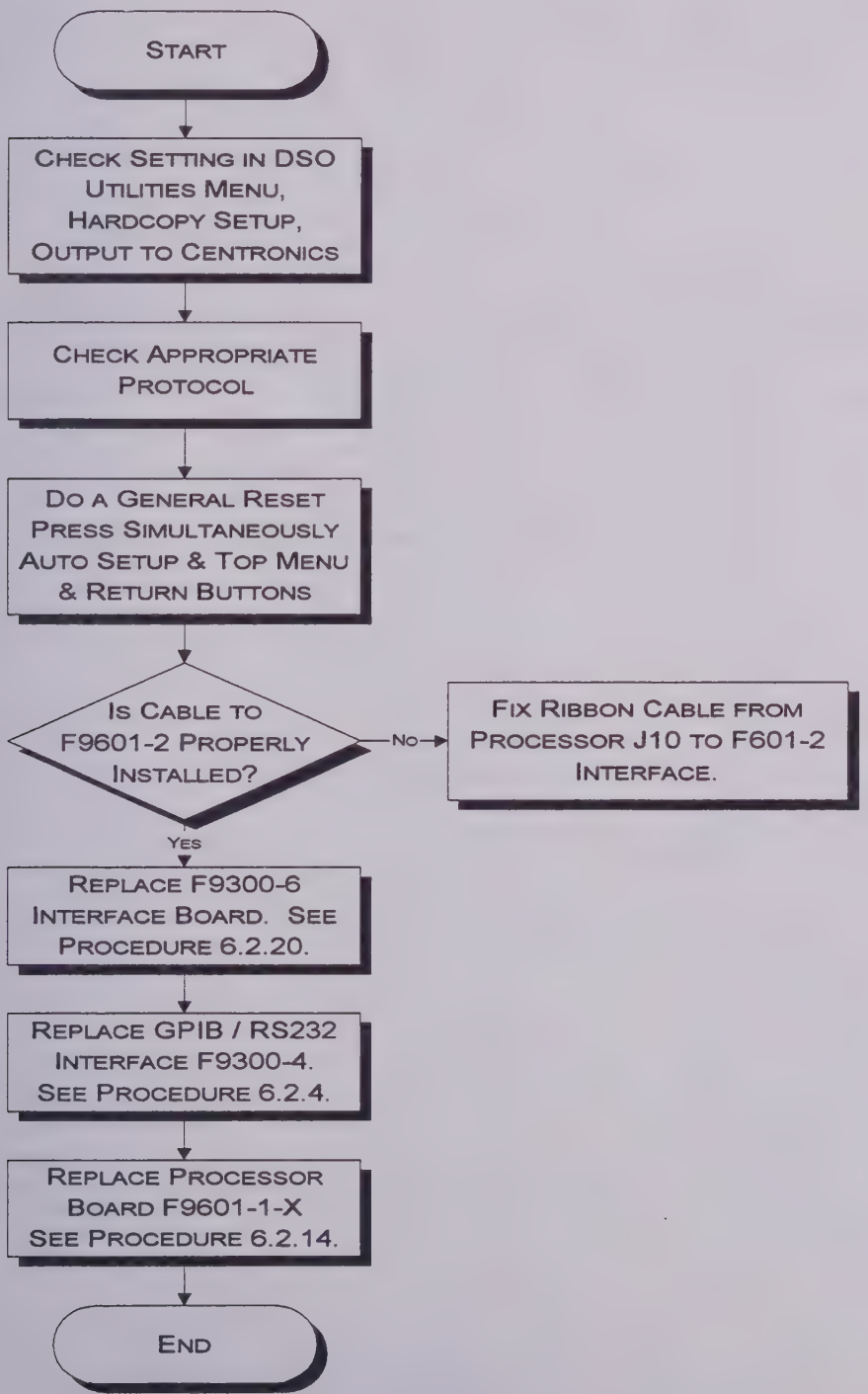
6.6.11 Floppy Disk Drive Problem



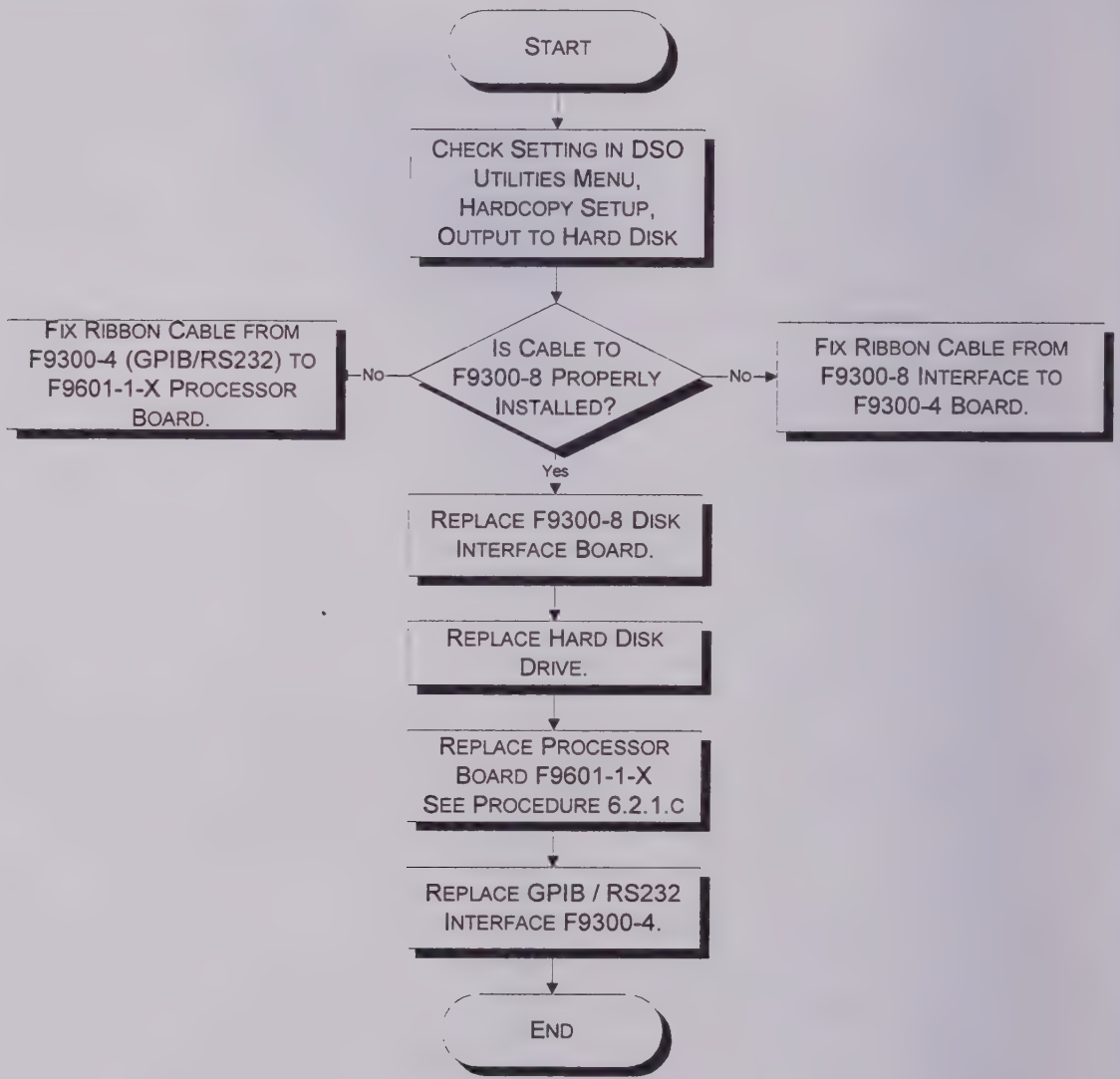
6.6.12 Graphic Printer Problem



6.6.13 Centronics Problem



6.6.14 Hard Disk Drive Problem



7. Replaceable Parts

To order parts, contact your local LeCroy service office. A list of the service centers is given in section 2 of this manual. For boards, you can either order a new board or an exchange board. Exchange assemblies are factory repaired, inspected, tested and calibrated. If you order an exchange card, you must return the defective part.

This section applies to the following model :

LC574A, LC574AM & LC574AL

Lecroy Part Number	Description	Rev	Qty
F9601-1-8 for LC574A & AM	Color UP Card & 2X4MB DRAM	E	1
F9601-1-64 for LC574AL	Color UP Card & 2X32MB DRAM	E	1
F9601-2	Centronics & VGA Interface	F	1
9384M-2 for LC574A & AM	Acquisition Memory 2x500K	B	2
9384MEM-2 for LC574AL	Acquisition Memory 2x1M	B	2
F9384-31	Main Card Quad 1000MS/s	D	1
F9300-4	GPIB + RS232 Interface Card	A	1
F9354-4	Time Base Board	E	1
F9601-6	Floppy Disk Drive Assy	D	1
F9300-7	Printer Controller	F	1
F9300-8	Hard Disk Interface	B	1
F9601-8	Main Switch Assembly	A	1
CD9610	Color Display Assy	D	1
FP9604	Front panel Assy 4 channel	K	1
MLC574A	Mechanical parts	C	1
PSLC574 or 900024	Power supply for Color box	B	1
RPLC574	Rear panel assembly	B	1
LCXXX-GP01	Upper cover assembly	B	1
USLC574	Upper shield rod assembly	B	1
ACC-LC574A	Accessories	H	1
205750000	Gate Array 16v8	A	1
705740301	LC574A Front Label	A	1
705704302	LC574AM Front Label	A	1
705740303	LC574AL Front Label	A	1
709600050	9600 Logo LeCroy	A	1
705740017	LC574 Serial Number Plate	A	1
780981015	Flat cable 2x20 (15 cm)	A	1

F9601-1-8 : Processor Card with 2X4MB DRAM

Lecroy Part Number	Description	Rev	Qty
205800130	MODULE DRAM 1MX32 BIT		2
S9601-1	PROCESS. CARD WHOUT DRAM		1

F9601-1-64 : Processor Card with 2X32MB DRAM

Lecroy Part Number	Description	Rev	Qty
205800800	MODULE DRAM 8 MX32 BIT		2
S9601-1	PROCESS. CARD WHOUT DRAM		1

S9601-1 : Processor Card without DRAM

Lecroy Part Number	Description	Rev	Qty
161225103	RES CARBON FILM 10 K		1
161225910	RES CARBON FILM 91 OHMS		2
270170103	TRANSISTOR NPN MPS918		1
290120009	DELAY LINE 9 N-SEC		2
309380016	CRYSTAL OSCILLATOR (PROG) 16 MHZ		1
312590070	BATTERY LITHIUM 3V 70MAH		1
400331020	SOCKET IC SOLD TAIL DIP-20		1
404500068	CONN BD TO BD 68 POS		1
453250072	CONN PC EDGE/SOLD TAIL 72		2
454110026	HDR SOLD TAIL MALE 26 ST		1
454110040	HDR SOLD TAIL/MALE 40/STRAIGHT		2
454110120	HDR SOLD TAIL/MALE 20/STRAIGHT		2
454312010	HDR SOLD TAIL/MALE 10		1
454314016	HDR SOLD TAIL/MALE 16		2
455410096	CONN RT ANGL MALE 96 S-CLIP		1
550010108	SCREW PAN HEAD PHIL M3X8 W/NYLOCK		4
552130101	NUT HEX M3		2
591002130	WIRE TEF BLK SOLID AWG 30		1
595901020	SLEEVING TEFLON AWG 20		1
709450321	HEAT SINK		1
719601103	PC BD PREASS'Y 9601-1		1
CH599045013	THERMALLY CONDUCTIVE ADHESIVE		0
SM200172138	IC 3 TO 8 DECODER 74F138		2
SM200178002	IC 2-INPUT NOR HCT02		1

S9601-1 : Processor Card without DRAM

Lecroy Part Number	Description	Rev	Qty
SM200178004	IC HEX INVERTER HCT04		1
SM200178086	IC 2-IN EXCL-OR HCT86		2
SM200178139	IC 2-TO-4-LINE DECODER HCT139		1
SM200178374	IC D-TYP FLOP 74HCT374		2
SM200276068	IC RTC SERIAL 68HC68T1		1
SM200278390	IC 4-BIT RIPPLE COUNTER 74HCT390		1
SM200344174	IC HEX D-FLOP HCT 174		1
SM205144001	IC 8-MBIT FLASH MEM 28F008SA		2
SM205219257	IC 32K X 8 SCRAM		1
SM205244260	IC 256K X 16 DRAM MCM54260		2
SM205921982	PROGRAMMED GAL DRAMES_Y		1
SM205921983	PROGRAMMED GAL RASADE_Y		1
SM205921984	PROGRAMMED GAL RAMEUR_X		1
SM205921986	PROGRAMMED GAL CARDAN_Z		1
SM205921987	PROGRAMMED GAL GRANDS_Z		1
SM205921988	PROGRAMMED GAL OCCASE_Z		1
SM205921989	PROGRAMMED GAL PROFIL_Z		1
SM205921990	PROGRAMMED GAL SAVEUR_Z		1
SM205921991	PROGRAMMED GAL SEVERE_Z		1
SM205921992	PROGRAMMED GAL VIADUC_Z		1
SM205921993	PROGRAMMED GAL PETITS_Z		1
SM205921996	PROGRAMMED GAL BUDGET_Z		1
SM205921997	PROGRAMMED GAL ASSISE_Z		1
SM205921999	PROGRAMMED GAL RETINE_Z		1
SM207170036	IC HEX BUFFER 3-STATE 74HCT365		3
SM207178541	IC BUFFER/LINE DR HCT541		7
SM207179244	IC BUFFER/LINE DRIV HCT244		1
SM207660150	IC DYNAMIC BUS SIZER MC68150		1
SM207665545	IC FLAT PANEL VGA CONTROLLER		1
SM207878245	IC BUS TRANSCVR HCT245		3
SM207972157	IC DATA SEL/MUX 74F157A		4
SM207978157	IC 2-INPUT MUX HCT157		1
SM208277770	IC DUAL PWR SUPPLY SUPR 7770-5		1
SM208470358	IC DUAL OP AMP LM358D		2
SM208680916	IC LOW SKEW CLOCK DRIVER 88916		1
SM208780109	IC MICROPOWER DC-DC CONV 1109CS8		1
SM227063201	IC IBM/PC FLOPPY DISK CONTROLLER		1

S9601-1 : Processor Card without DRAM

Lecroy Part Number	Description	Rev	Qty
SM227300059	IC INTERRUPT CONTROLLER UPD71059		1
SM227300603	IC RISC PROCESSOR MPC603E		1
SM232032814	DIODE ARRAY 2814		1
SM236030099	DIODE SO-PKG BAV99		3
SM253032823	DIODE SCHOTTKY 2823		1
SM256232013	DIODE LIGHT EMITTING RED		1
SM270130092	TRANSISTOR NPN BFR92A		1
SM270330848	TRANSISTOR NPN BC848C		1
SM275330858	TRANSISTOR PNP BC858C		1
SM280171005	TRANSISTOR POWER MOSFET MTD10N05E		2
SM300056332	INDUCTOR WOUND 33 UH		1
SM300327102	INDUCTOR WOUND 1 UH		1
SM301502001	BEAD (FERRITE CHIP)		3
SM310300406	CRYSTAL 32768 HZ		1
SM310900024	CRYSTAL 24 MHZ SMD		1
SM653101201	RES CHIP 1% 10.0 OHMS		4
SM653101218	RES CHIP 1% 15.0 OHMS		1
SM653101234	RES CHIP 1% 22.1 OHMS		28
SM653101266	RES CHIP 1% 47.5 OHMS		7
SM653101269	RES CHIP 1% 51.1 OHMS		9
SM653101289	RES CHIP 1% 82.5 OHMS		3
SM653101297	RES CHIP 1% 100 OHMS		10
SM653101314	RES CHIP 1% 150 OHMS		5
SM653101330	RES CHIP 1% 221 OHMS		1
SM653101334	RES CHIP 1% 243 OHMS		2
SM653101347	RES CHIP 1% 332 OHMS		1
SM653101362	RES CHIP 1% 475 OHMS		1
SM653101365	RES CHIP 1% 511 OHMS		10
SM653101393	RES CHIP 1% 1.00 K		53
SM653101401	RES CHIP 1% 1.21 K		2
SM653101410	RES CHIP 1% 1.50 K		3
SM653101426	RES CHIP 1% 2.21K		1
SM653101430	RES CHIP 1% 2.43 K		1
SM653101450	RES CHIP 1% 3.92 K		1
SM653101458	RES CHIP 1% 4.75 K		33
SM653101477	RES CHIP 1% 7.50 K		1
SM653101489	RES CHIP 1% 10.0 K		43
SM653101506	RES CHIP 1% 15.0 K		2
SM653101554	RES CHIP 1% 47.5 K		1
SM653101585	RES CHIP 1% 100 K		3
SM653101602	RES CHIP 1% 150 K		1

S9601-1 : Processor Card without DRAM

Lecroy Part Number	Description	Rev	Qty
SM653101635	RES CHIP 1% 332 K		2
SM653101650	RES CHIP 1% 475 K		1
SM653101777	RES CHIP 1% 10.0 M		2
SM654101000	CHIP JUMPER ZERO OHMS		14
SM661207102	CAP CERA CHIP 20% .001 UF		1
SM661207103	CAP CERA CHIP 20% .01 UF		102
SM661207104	CAP CERA CHIP 20% .1 UF		5
SM661255100	CAP CERA CHIP 5% 10 PF		2
SM661255101	CAP CERA CHIP 5% 100 PF		4
SM661255180	CAP CERA CHIP 5% 18 PF		2
SM661255221	CAP CERA CHIP 5% 220 PF		2
SM666217106	CAP MOLD TANT CHIP 10 UF		2
SM666237476	CAP MOLD TANT CHIP 47 UF		1
SM666257336	CAP MOLD TANT CHIP 33 UF		9
SM666327225	CAP MOLD TANT CHIP 2.2 UF		1

9384M-2: Acquisition Memory 2 X 500 K

Lecroy Part Number	Description	Rev	Qty
454110024	HDR 2MM PRESSFIT TO MALE 24		9
719384202	PC BD PREASS'Y 9384L-2	1002	1
SM200170032	IC 2-IN OR GATE 74F32		1
SM200470573	IC 3.3V D-TYPE LATCH		2
SM205211001	IC 32K X 36 SYNC SRAM		16
SM653101339	RES CHIP 1% 274 OHMS		2
SM654101000	CHIP JUMPER ZERO OHMS		9
SM661207104	CAP CERA CHIP 20% .1 UF		51
SM666267227	CAP TANT 220UF 10V 20%		31

9384MEM-2 : Acquisition Memory 2 X 2 M

Lecroy Part Number	Description	Rev	Qty
454110024	HDR 2MM PRESSFIT TO MALE 24		9
719384202	PC BD PREASS'Y 9384L-2	1002	1
SM200170032	IC 2-IN OR GATE 74F32		1
SM200470573	IC 3.3V D-TYPE LATCH		2
SM205211002	IC 64K X 32 SYNC SRAM		16
SM653101339	RES CHIP 1% 274 OHMS		2
SM654101000	CHIP JUMPER ZERO OHMS		9
SM661207104	CAP CERA CHIP 20% .1 UF		51
SM666267227	CAP TANT 220UF 10V 20%		31

F9601-2 : Centronics & VGA Interface

Lecroy Part Number	Description	Rev	Qty
405204000	JACKSCREW 3/16 HEX M/F 4-40THD		6
454110040	HDR SOLD TAIL/MALE 40/STRAIGHT		1
454520025	CONN RT ANGLE FEM 25 S-CLIP		1
454630015	CONN FEM SUBMINIATURE D-15		2
550010706	SCREW ECO-FIX PHIL PAN M3X6 W/NYLOC		2
709601211	9601-2 BRACKET	B	1
719601203	PC BD PREASS'Y 9601-2	B	1
SM253032823	DIODE SCHOTTKY 2823		4
SM270330848	TRANSISTOR NPN BC848C		3
SM301502001	BEAD (FERRITE CHIP)		6
SM653101269	RES CHIP 1% 51.1 OHMS		5
SM653101285	RES CHIP 1% 75.0 OHMS		3
SM653101393	RES CHIP 1% 1.00 K		3
SM653101439	RES CHIP 1% 3.01 K		6
SM653101522	RES CHIP 1% 22.1 K		2
SM661207104	CAP CERA CHIP 20% .1 UF		1
SM661255470	CAP CERA CHIP 5% 47 PF		19
SM661255471	CAP CERA CHIP 5% 470 PF		2

F9384-31 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
900022-01	4 CHANNEL 1 GS/S MAIN BOARD		1

FPLC574-3 : Main Card Panel

Lecroy Part Number	Description	Rev	Qty
FPLC574-3	MAIN CARD FRNT PANEL LC574XX (PEMS)		1

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
146544471	CAP MINI ALUM 20% 470 UF		1
146554476	CAP MINI ALUM 20% 47 UF		2
146574227	CAP MINI ALUM 20% 220 UF		3
146654107	CAP MINI ALUM 20% 100 UF		2
158899003	CAP VARIABLE .5 - 2.5 PF		4
161030000	RES COMP ZERO OHMS		1
161225390	RES CARBON FILM 39 OHMS		1
161225820	RES CARBON FILM 82 OHMS		1
168909001	RES ULTRA PREC 900K 0.25% 500V		10
169416473	RESISTOR DISC NTC 47 K		1
208123002	IC +12 VOLT REG LM340T-12		3
208124003	IC VOLT REG -12V LM320T-12		3
235010005	DIODE RECTIFIER 1N4005		1
290120005	DELAY LINE 5 N-SEC		1
290120009	DELAY LINE 9 N-SEC		1
290199015	DELAY LINE 1.5 NS		2
290199020	DELAY LINE 2.0 NS		1
311210010	CRYSTAL OSCILLATOR 3PPM 10MHZ		1
430430004	RELAY HF 12V MINIATURE		21
430490003	RELAY 2 FORM C DPDT		1
430490005	RELAY 1 FORM C SPDT		8
454111024	HDR 2MM PRESSFIT TO FEMALE 4X6		18
454112024	HDR SOLD TAIL/MAIL 24		1
454117003	FRICTION HEADER STRAIGHT .1 CENTERS		1
454220096	HDR PRESSFIT TO FEM 96		1
454312004	HDR SOLD TAIL/WW 4		4
454312010	HDR SOLD TAIL/MALE 10		1
454313010	HDR DIP SOLD TO PCB 2X5		7
454340002	HDR SOLD TAIL/WW 2		10
454390002	HDR FRICTION LOCK 2-PIN		1
454710002	HDR SOLD TAIL/MALE 2		1
505019968	HEAT SINK VERTICAL MTG		2
505070220	HEATSINK WITH TAG FOR TO-220		2
505112016	HEAT SINK FOR DIP-16		5
505121002	HEATSINK 1.5"X.65", .8" HIGH		2
505121003	HEATSINK, 1.1"X1.0", .8" HIGH		2
505121004	HEATSINK, .9"X1.0", 8" HIGH		1
530040007	BUZZER 85DB 5V SMALL		1
593910001	CABLE CO-AXIAL RG178B/U		5
594220026	MICRO WIRE CLIP, SIDE ENTRY		7

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
709354411	9354-4 OSCILLATOR SHIELD		1
709370311	HFE419 HEATSINK		4
709370321	HFE419 HEATSINK CLIP		4
709384013	HEATSINK 24 X 23 X 32H	1001	2
709384014	HEATSINK 42 X 25 X 32H	1000	2
7093XXP01	RIGHT ANGLE RECEPT. CONNECTOR		6
7093XXP21	BULKHEAD RECEPTACLE FEMALE BNC		6
719384301	PC BD PREASSEMBLY 9384-3	1301	1
CH599041022	HEAT SINK COMPOUND 251		0
CH599045013	THERMALLY CONDUCTIVE ADHESIVE		0
F9354-4	400-500MHZ PLL OSCILLATOR	1005	1
F9384-7	T-COIL 9384	1001	4
FP9384-3	MAIN CARD FRONT PANEL 9384-3	1100	1
HAD621	HYBRID 1GS/S DUAL DIFF INPUT ADC	1022	4
HFE624	HYBRID FRONT END HFE624	1000	4
MCL404	IC MEM GATE ARRAY MCL404		1
MDX622	IC 2:8 ECL TO TTL DEMULTIPLEXER		4
MST412	IC SMART TRIGGER GATE ARRAY MST412		1
MTB411	IC TIME BASE GATE ARRAY MTB411		1
MTR408	INTEGRATED TRIGGER		5
SM158240200	CAP VARIABLE .6 - 2.5 PF		10
SM158240201	CAP VARIABLE 1 - 5 PF		1
SM158240203	CAP VARIABLE 5 - 18 PF		8
SM168651297	RES METAL FILM 1% 100 OHM		2
SM168651315	RES METAL FILM 1% 154 OHMS		14
SM168659004	RES METAL FILM .1% 900 OHMS		1
SM168659006	RES METAL FILM .1% 111.1 K		1
SM168659007	RES METAL FILM .1% 3.00K		4
SM168659297	RES METAL FILM .1% 100 OHMS		3
SM185457201	RES VARI CERMET 200 OHMS		5
SM185457203	RES VARI CERMET 20 K		5
SM185457501	RES VARI CERMET 500 OHMS		4
SM185457502	RES VARI CERMET 5 K		1
SM185457503	RES VARI CERMET 50 K		4
SM185657500	RES VARI CERMET 500 OHMS 3MM		12
SM190361222	RES NETWORK 2.2K		1
SM200167102	IC NOR GATE 10H102		2

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
SM200167164	IC 8 TO 1 MPLX 10H164		1
SM200169016	IC BINARY UP COUNTER 10E016		3
SM200169191	IC UP-DOWN BIN COUNTER N74F191D		5
SM200170032	IC 2-IN OR GATE 74F32		2
SM200178000	IC 2-INPUT NAND HCT00		1
SM200178002	IC 2-INPUT NOR HCT02		3
SM200178030	IC 8-IN NAND HCT30		1
SM200178074	IC D-TYP FLOP 74HCT74		2
SM200178138	IC 3-TO-8-LINE DECODER HCT138		4
SM200178273	IC D-TYP FLOP 74HCT273		2
SM200178374	IC D-TYP FLOP 74HCT374		1
SM200278040	IC COUNTER HCT4040		1
SM200470573	IC 3.3V D-TYPE LATCH		4
SM201164104	IC QUINT 2-IN AND/NAND 10E104		1
SM201164131	IC M/S D-TYP FLOP 10E131		1
SM201174001	IC ECL 4 IN OR/NOR 10EL01D		3
SM201174005	IC ECL 2-IN DIFF AND/NAND 10EL05D		16
SM201174011	IC ECL 1:2 DIFF CLOCK DRVR 10EL11D		25
SM201174031	IC ECL FLIP FLOP SET/RESET 10EL31D		9
SM201274032	IC ECL DIVIDE BY 2 10EL32D		3
SM201274033	IC ECL DIVIDE BY 4 MC10EL33		1
SM201570016	IC ECL DIFF RECEIVER 10EL16D		2
SM201574058	IC ECL 2:1 MUX 10EL58D		1
SM205045300	PROGRAMMED GAL MIMOSA-A		1
SM205045350	PROGRAMMED GAL ROUTE1-A		1
SM205045351	PROGRAMMED GAL ROUTE2-A		1
SM205045352	PROGRAMMED GAL ROUTE2-B		1
SM205045354	PROGRAMMED GAL AVENUE-A		1
SM205045355	PROGRAMMED GAL RUELLE-A		1
SM205045357	PROGRAMMED GAL CHEMIN-A		1
SM205045358	PROGRAMMED GAL ROUTE 3-C		1
SM205045359	PROGRAMMED GAL ARTERE-B		1
SM205108016	IC EEPROM 16K BIT IIC BUS		2
SM205618165	IC 8-BIT SHIFT REG 74HCT165		1
SM205618594	IC 8-BIT SHIFT REG 74HC594		23
SM205701070	IC 128KX8 STAT RAM 70 NS		4
SM206070584	IC BUS CONTROLLER 8584		1
SM206260858	IC OCT 8-BIT ADC SYSTEM 858		1
SM206884623	IC OCTAL BUS TRANSCVR ABT623		6
SM206885245	IC BUS TRANSCVR ABT245		2

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
SM206970457	IC 3 DIFF 2:1 MUX MC10E457		1
SM206980056	IC ECL DUAL DIFF 2:1 MUX MC100EL56		7
SM207130025	TRANSISTOR NPN BFT25A		1
SM207170367	IC HEX BUFFER 74HC367		1
SM207171244	IC OCTAL BUFFER ABT244		4
SM207280703	IC 16-BIT DAC 703		1
SM207288800	IC OCTL 8-BIT CMOS D/A CONV DAC8800		3
SM207360125	IC TRANSLATOR MC10125		3
SM207367124	IC TRANSLATOR 10H124		1
SM207367125	IC TRANSLATOR 10H125		1
SM207770201	IC ANALOG SWITCH DG201		4
SM207770403	IC ANALOG SWITCH DG403		1
SM207770442	IC ANALOG SWITCH DG442		5
SM207960157	IC QUAD 2:1 MULTIPLEXER 10E157		1
SM207970057	IC 4:1 DIFF MUX 10EL57		3
SM207970139	IC DECODER/DEMUX 74F139		3
SM207970351	IC OCTAL ANALOG MUX/DEMUX 74HC4351		1
SM207970508	IC ANALOG MULT PLX 8 TO 1 DG508		1
SM207972157	IC DATA SEL/MUX 74F157A		1
SM207978153	IC 4-INPUT MUX HCT153		1
SM207978251	IC 8-IN MUX 3-ST 74HCT251		2
SM208030245	IC TRANS ARRAY NPNX6 SL3245		1
SM208470037	IC OP AMP 37GS		1
SM208470111	IC HF BUFFER CLC111		4
SM208470324	IC OP AMP LM324M		1
SM208470347	IC J-FET OP AMP 347		12
SM208470351	IC J-FET OP AMP 351		1
SM208470353	IC DUAL OP AMP LF353		3
SM208470705	IC OP AMP PICOAMP INPUT AD705		13
SM208480640	IC WIDEBAND OP AMP OPA640		4
SM208570078	IC LOW POWER REG +12V 78L12		1
SM208570805	IC POS VOLT REG 78L05		2
SM208591336	IC VOLT REF DIODE LM336		2
SM208870339	IC VOLT COMPARATOR 339		6
SM208880079	IC LOW POW REG -12V 79L12		1
SM208880337	IC ADJ VOLT REG LM337		4
SM208971881	IC VIDEO SYNC SEPARATOR LM1881		1
SM229020150	MLC TRANS VOLT SUPPRESSOR		6
SM232022822	DIODE ARRAY SCHOTTKY 2822		2

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
SM232120070	DIODE ARRAY BAV70		3
SM236030099	DIODE SO-PKG BAV99		76
SM236654004	DIODE RECTIFIER 4004		2
SM240050033	DIODE ZENER TZM-C-3V3		5
SM240050051	DIODE ZENER TZM-C-5V1		1
SM240218451	DIODE ZENER BZX84C5V1		19
SM240218462	DIODE ZENER BZX84C6V2		4
SM240218475	DIODE ZENER BZX84C7V5		2
SM252023018	DIODE PIN BAT18		5
SM252080682	DIODE PIN BA682		5
SM253032823	DIODE SCHOTTKY 2823		11
SM270030020	TRANSISTOR NPN BFS20		1
SM270130092	TRANSISTOR NPN BFR92A		4
SM270130093	TRANSISTOR NPN BFR93A		3
SM270160520	TRANSISTOR NPN HF BFG520/X		13
SM275030092	TRANSISTOR PNP BFT92		4
SM275030093	TRANSISTOR PNP BFT93		2
SM275030550	TRANSISTOR PNP BF550		6
SM275330858	TRANSISTOR PNP BC858C		10
SM280120416	TRANSISTOR JFET N MMBF4416		5
SM280171005	TRANSISTOR POWER MOSFET MTD10N05E		4
SM289772003	TRANSISTOR ARRAY 2003		4
SM300446150	INDUCTOR 10% .015 UH		1
SM301502001	BEAD (FERRITE CHIP)		36
SM311414318	CRYSTAL OSCILLATOR 14.31818MHZ		1
SM454120025	CONN 1MM FEMALE 25		1
SM651104182	RES CHIP 1% 25PPM 1.8K		1
SM651104183	RES CHIP 1% 25PPM 18 K		1
SM651104204	RES CHIP 1% 25PPM 200 K		1
SM651104241	RES CHIP 1% 25PPM 240 OHM		1
SM651104392	RES CHIP 1% 25PPM 3.9K		5
SM652061024	RES CHIP 1% 2.4 OHM .063W		4
SM652061181	RES CHIP 1% 182 OHM .063W		4
SM652061820	RES CHIP 1% 82.0 OHM .063W		4
SM652110904	RES CHIP (E24) 0.5% 900K		1
SM652115062	RES CHIP (E24) 5% 6.2 OHMS		1
SM652181590	RES CHIP 1% PRECISION 113K		8
SM653101201	RES CHIP 1% 10.0 OHMS		5
SM653101230	RES CHIP 1% 20.0 OHMS		2
SM653101234	RES CHIP 1% 22.1 OHMS		18
SM653101251	RES CHIP 1% 33.2 OHMS		24
SM653101255	RES CHIP 1% 36.5 OHMS		2

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Lecroy Part Number	Description	Rev	Qty
SM653101266	RES CHIP 1% 47.5 OHMS		2
SM653101269	RES CHIP 1% 51.1 OHMS		85
SM653101273	RES CHIP 1% 56.2 OHMS		20
SM653101281	RES CHIP 1% 68.1 OHMS		99
SM653101285	RES CHIP 1% 75.0 OHMS		15
SM653101289	RES CHIP 1% 82.5 OHMS		13
SM653101297	RES CHIP 1% 100 OHMS		32
SM653101305	RES CHIP 1% 121 OHMS		74
SM653101308	RES CHIP 1% 130 OHMS		37
SM653101314	RES CHIP 1% 150 OHMS		28
SM653101322	RES CHIP 1% 182 OHMS		150
SM653101326	RES CHIP 1% 200 OHMS		41
SM653101330	RES CHIP 1% 221 OHMS		13
SM653101334	RES CHIP 1% 243 OHMS		8
SM653101339	RES CHIP 1% 274 OHMS		6
SM653101343	RES CHIP 1% 301 OHMS		13
SM653101347	RES CHIP 1% 332 OHMS		13
SM653101351	RES CHIP 1% 365 OHMS		3
SM653101354	RES CHIP 1% 392 OHMS		21
SM653101358	RES CHIP 1% 432 OHMS		16
SM653101362	RES CHIP 1% 475 OHMS		23
SM653101365	RES CHIP 1% 511 OHMS		5
SM653101369	RES CHIP 1% 562 OHMS		5
SM653101373	RES CHIP 1% 619 OHMS		7
SM653101377	RES CHIP 1% 681 OHMS		1
SM653101381	RES CHIP 1% 750 OHMS		3
SM653101385	RES CHIP 1% 825 OHMS		1
SM653101393	RES CHIP 1% 1.00 K		111
SM653101397	RES CHIP 1% 1.10 K		10
SM653101401	RES CHIP 1% 1.21 K		7
SM653101410	RES CHIP 1% 1.50 K		3
SM653101416	RES CHIP 1% 1.74K		4
SM653101418	RES CHIP 1% 1.82 K		15
SM653101422	RES CHIP 1% 2.00 K		6
SM653101439	RES CHIP 1% 3.01 K		1
SM653101443	RES CHIP 1% 3.32 K		30
SM653101450	RES CHIP 1% 3.92 K		5
SM653101458	RES CHIP 1% 4.75 K		8
SM653101461	RES CHIP 1% 5.11 K		40
SM653101465	RES CHIP 1% 5.62 K		8
SM653101481	RES CHIP 1% 8.25 K		6
SM653101489	RES CHIP 1% 10.0 K		119
SM653101506	RES CHIP 1% 15.0 K		1
SM653101509	RES CHIP 1% 16.2 K		5

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
SM653101514	RES CHIP 1% 18.2 K		1
SM653101522	RES CHIP 1% 22.1 K		1
SM653101531	RES CHIP 1% 27.4 K		1
SM653101557	RES CHIP 1% 51.1 K		4
SM653101569	RES CHIP 1% 68.1 K		5
SM653101585	RES CHIP 1% 100 K		2
SM653101602	RES CHIP 1% 150 K		4
SM653101614	RES CHIP 1% 200 K		4
SM653101638	RES CHIP 1% 357K		8
SM653101639	RES CHIP 1% 365 K		8
SM653101642	RES CHIP 1% 392 K		8
SM653101650	RES CHIP 1% 475 K		1
SM653101665	RES CHIP 1% 681 K		1
SM653101673	RES CHIP 1% 825 K		2
SM653101681	RES CHIP 1% 1.00 M		9
SM653181999	THERMAL SHUNT		1
SM653185107	RES CHIP 5% 100PPM 100M		5
SM654101000	CHIP JUMPER ZERO OHMS		50
SM661205822	CAP CERA CHIP 8200 PF		5
SM661207102	CAP CERA CHIP 20% .001 UF		4
SM661207103	CAP CERA CHIP 20% .01 UF		522
SM661207104	CAP CERA CHIP 20% .1 UF		157
SM661207223	CAP CERA CHIP 20% .022 UF		8
SM661255010	CAP CERA CHIP 1.0 PF		1
SM661255039	CAP CERA CHIP +/-0.25PF 3.9 PF		4
SM661255056	CAP CERA CHIP 5.6 PF		2
SM661255100	CAP CERA CHIP 5% 10 PF		9
SM661255101	CAP CERA CHIP 5% 100 PF		22
SM661255102	CAP CERA CHIP 5% 1000 PF		11
SM661255180	CAP CERA CHIP 5% 18 PF		1
SM661255181	CAP CERA CHIP 5% 180 PF		1
SM661255220	CAP CERA CHIP 5% 22 PF		1
SM661255270	CAP CERA CHIP 5% 27 PF		5
SM661255330	CAP CERA CHIP 5% 33 PF		1
SM661255470	CAP CERA CHIP 5% 47 PF		6
SM661255560	CAP CERA CHIP 5% 56 PF		2
SM661255821	CAP CERA CHIP 5% 820 PF		5
SM661256120	CAP CERA CHIP 10% 12 PF		4
SM661286103	CAP CERA CHIP 10% .01 UF		52
SM661446474	CAP CERA CHIP 10% .47 UF		2
SM661526561	CAP CERA CHIP 560PF 500V		5
SM661535620	CAP CERA CHIP 62PF 200V		4
SM661540033	CAP CERA CHIP 3.3PF 500V		6
SM661545150	CAP CERA CHIP 15PF 500V		9

900022-01 : Main Acquisition Board

Lecroy Part Number	Description	Rev	Qty
SM661726103	CAP CERA CHIP 10% .01 UF		15
SM666237476	CAP MOLD TANT CHIP 47 UF		9
SM666247106	CAP MOLD TANT CHIP 10 UF		4
SM666257336	CAP MOLD TANT CHIP 33 UF		2
SM666267227	CAP TANT 220UF 10V 20%		8
SM666327225	CAP MOLD TANT CHIP 2.2 UF		50
SM666377226	CAP MOLD TANT CHIP 22 UF		8
SM666387336	CAP MOLD TANT CHIP 33 UF		2
SM666427105	CAP MOLD TANT CHIP 1 UF		5
SM669080181	CHIP FERRITE BEAD		36

F9354-4 : Time Base Board

Lecroy Part Number	Description	Rev	Qty
719354403	PC BD PREASS'Y 9354-4	D	1
SM200169016	IC BINARY UP COUNTER 10E016		1
SM201274032	IC ECL DIVIDE BY 2 10EL32D		1
SM201549040	IC PHASE-FREQ DET MC12040		1
SM201570016	IC ECL DIFF RECEIVER 10EL16D		1
SM208272148	IC LOW POWER VCO MC12148		1
SM208470027	IC SINGLE OP AMP OP-27		1
SM208570078	IC LOW POWER REG +12V 78L12		1
SM208570805	IC POS VOLT REG 78L05		1
SM208880079	IC LOW POW REG -12V 79L12		1
SM230080619	DIODE TUNING SMD BB619		1
SM236030099	DIODE SO-PKG BAV99		4
SM240218475	DIODE ZENER BZX84C7V5		2
SM281120610	LOW POWER PMOSFET TRANSISTOR		1
SM301502001	BEAD (FERRITE CHIP)		1
SM303062068	INDUCTOR CHIP COIL 2% 6.8NH		1
SM454110025	CONN 1MM MALE 25		1
SM653101314	RES CHIP 1% 150 OHMS		1
SM653101322	RES CHIP 1% 182 OHMS		5
SM653101365	RES CHIP 1% 511 OHMS		2
SM653101389	RES CHIP 1% 909 OHMS		2
SM653101393	RES CHIP 1% 1.00 K		3
SM653101426	RES CHIP 1% 2.21K		1
SM653101447	RES CHIP 1% 3.65 K		4
SM653101557	RES CHIP 1% 51.1 K		1
SM661207103	CAP CERA CHIP 20% .01 UF		13
SM661207104	CAP CERA CHIP 20% .1 UF		2
SM661207223	CAP CERA CHIP 20% .022 UF		2

F9354-4 : Time Base Board

Lecroy Part Number	Description	Rev	Qty
SM661255010	CAP CERA CHIP 1.0 PF		1
SM661255152	CAP CERA CHIP 5% 1500 PF		2
SM661255270	CAP CERA CHIP 5% 27 PF		1
SM666247106	CAP MOLD TANT CHIP 10 UF		7

F9300-4 : GPIB + RS232 INTERFACE CARD

Lecroy Part Number	Description	Rev	Qty
102484471	CAP CERA DISC 100V 470 PF		6
106435103	CAP CERA MONO .01UF		5
106438104	CAP CERA MONO .1UF		5
147436033	CAP ALUM METAL CAN 33 UF		4
161225302	RES CARBON FILM 3 K		1
161225471	RES CARBON FILM 470 OHMS		1
161225682	RES CARBON FILM 6.8 K		2
190832102	RESISTOR NETWORK 1 K		1
200333000	IC QUAD 2-IN NAND HCT00		1
205750000	IC GAL16V8A-15LP		1
207197210	IC BUS INTERF CONTR 7210		1
207440232	IC XMTR/RCVR MAX232		1
207470160	IC BUS TRANSCEIVER 75160B		1
207470161	IC OCTL BUS XCEIVR 75161A		1
207552661	IC INTERFACE 2661A		1
309040005	CRYSTAL OSCILLATOR 4.9152 MHZ		1
453521024	CONN RT ANGLE IEEE FEM 24		1
454511040	HDR SOLD TAIL/MALE 40/RT		1
455413009	CONN RT ANGL MALE 9 S-CLIP		1
455980002	MOUNTING HDW FOR CONN SHELL		2
550010106	SCREW PAN HEAD PHIL M3X6 W/NYLOCK		4
550010108	SCREW PAN HEAD PHIL M3X8 W/NYLOCK		2
551430400	WASHER SHAKEPROOF M3		4
709300411	GPIB-RS232 INTERFACE BRACKET		1
709300421	LABEL RS232-IEEE488-2		1
719300403	PC BD PREASS'Y 9300-4		1

F9601-6 : Floppy Disk Drive Assembly

Lecroy Part Number	Description	Rev	Qty
330000002	FLOPPY DISK DRIVE 3.5"		1
453411026	CONN ZIF FOR FFC 26 POS		1
454511026	HDR SOLD TAIL/MALE 26		1
550010103	SCREW PAN HEAD PHIL M2.5X3 W/NYLOCK		4
550010706	SCREW ECO-FIX PHIL PAN M3X6 W/NYLOC		2
709600611	FLOPPY DRIVE SUPPORT		1
719601603	PC BD PREASS'Y FOR 9601-6		1
780919905	FLAT FLEX CABLE 26 P. 5CM		1
453411026	CONN ZIF FOR FFC 26 POS		1
454511026	HDR SOLD TAIL/MALE 26		1
719601603	PC BD PREASS'Y FOR 9601-6		1

FP9604 : Front Panel Assembly

Lecroy Part Number	Description	Rev	Qty
551090001	LOCKWASHER M9		4
552090075	MOUNTING NUT M9 X 0.75		4
709600030	9600 FRONT FRAME	G	1
709600560	9600-5 KNOB DIAM 9	C	7
709600570	9600-5 KNOB DIAM 12	C	4
780721022	FLAT CABLE 2X10 (22CM)	A	1
F9602-5	KEYPAD FRONT PANEL	I	1
F9604-5	QUAD CHANNEL FRONT PANEL	C	1

F9602-5 : Keypad Assembly

Lecroy Part Number	Description	Rev	Qty
551423100	FLAT WASHER M2.3		5
554422005	SCREW SELF TAPPING PT KA22x6		5
709600510	9600-5 SWITCH CAP, LIGHT GREY	D	32
709600512	9600-5 SWITCH CAP DARK GREY	D	11
709600514	9600-5 SWITCH CAP, BLUE	D	1
709600516	9600-5 SWITCH CAP, GREEN	D	1
709600534	9600-5 FRONT PANEL 4CH	A	1
709600550	9600-5 RUBBER MAT 4 CH.	D	1
S9602-5	KEYBOARD PCB ASSY 4 CHANNEL	B	1
256400105	LED YELLOW LOW CUR.		1
454224030	HDR 41612 PRESSF. FEM 30		1
719602503	PC BD PREASS'Y 9602-5	C	1

F9604-5 : Front Panel

Lecroy Part Number	Description	Rev	Qty
106438104	CAP CERA MONO .1UF		4
147436033	CAP ALUM METAL CAN 33 UF		1
161225471	RES CARBON FILM 470 OHMS		1
190042103	RESISTOR NETWORK 10 K		2
190642103	RESISTOR NETWORK 10 K		1
200331074	IC D-TYP FLOP 74HCT74		1
230020062	DIODE SWITCHING BAW62		34
425100024	ENCODER DIGITAL 24 POS		3
425101024	ENCODER DIGITAL 24 POS		8
454200030	HDR MALE THIRD 41612 TO FEM 30		1
454511020	HEADER RT ANGLE MALE 20		1
719603503	PC BD PREASS'Y 9603-5		1
MFP414	IC MONO FRNT PANEL PROCESSOR MFP414		1

CD9610 : Color Display Assembly

Lecroy Part Number	Description	Rev	Qty
CD9600-B	COLOR DISPLAY ASS'Y		1
709600230	9600-2 MONITOR SHIELD		1
CD9610-RK	RETIRFIT KIT FOR 9610		1

MLC574A : Mechanical

Lecroy Part Number	Description	Rev	Qty
315972600	RFI FILTER W/DBL FUSE BLOCK		1
377000104	LABEL, CE & UL, TEST EQUIP.	1000	1
405154002	CONN HOUSING 2-POS		1
405708001	TERMINAL ANTI-FISHHOOKING CRIMP		2
433162630	FUSE SLO-BLO 250V 6.30AMP		2
485325001	SET OF 4 FEET, DARK GREY		1
524010037	STANDOFF M3 37MM X 4.5MM HEX W/NYLO		3
530409212	FAN AXIAL 12V 1"THK 2.4W		1
550010106	SCREW PAN HEAD PHIL M3X6 W/NYLOCK	1001	13
550010116	SCREW PAN HEAD PHIL M3X16 W/NYLOCK		7

MLC574A : Mechanical

Lecroy Part Number	Description	Rev	Qty
550010130	SCREW PAN HEAD PHIL M3X30 W/NYLOCK	1001	12
550010508	SCREW FLAT HEAD PHIL M3X8 W/NYLOCK		2
550010705	SCREW ECO-FIX PHIL PAN M4X5 W/NYLOC		5
550010706	SCREW ECO-FIX PHIL PAN M3X6 W/NYLOC		48
550011106	SCREW PAN HD M2X6 BLK W/NYLOCK		12
550151116	SCREW PAN HD PHIL M5X16	1001	4
551620100	#2 FLAT WASHER S.STEEL/BLACK OXIDE		12
554035101	CLIP-ON NUT DIAM. 3.5		4
554422006	SCREW S/TAP PAN PHIL KA22X5		2
554435006	SCREW S/TAP PAN PHIL KA35X7		8
554440001	SCREW S/TAP PAN PHIL KA40X12		4
554525901	CLIP DIAM 3.1MM		1
705740013	TOP PARTITION FOR LC574	1000	1
705740015	LABEL, PROTECTIVE GND SYMBOL		1
705740016	LABEL, LC574 FUSE DATA		1
705740017	SERIAL NUMBER PLATE FOR DSO		1
705740038	LOWER COVER LCXXX DUAL FAN		1
7093XX931	INTERF. HOLE CLOSURE 93XX-9		3
7093XXP41	PROBE HOLDER		6
7093XXP91	PROBE RING CONTACT		6
709424096	MEMORY CARD INSERT		1
709600010	9600 BEZEL		1
709600020	9600 RIGHT HUB CAP		1
709600024	9600 LEFT HUB CAP		1
709600048	9600 UPPER COVER LOCK INSERT		2
709600050	9600 LOGO LECROY		1
709600075	9600 REAR FOOT		4
709600078	REAR FOOT RUBBER		4
709600810	9600-8 POWER SWITCH BUTTON		1
709600820	9600-8 POWER SWITCH ROD		1
709674351	9674-3 SHIELD LOWER PARTITION		6
780721105	20 LINE FLAT CABLE		1
780834509	GROUND CABLE YELLOW/GREEN 9CM		1
780891032	FLAT CABLE 2X20 (4 CONNECT)		1
780981003	FLAT CABLE 2X20 (3.5 CM)		1
780991606	FLAT CABLE 2X13 (6 CM)		1

MLC574A : Mechanical

Lecroy Part Number	Description	Rev	Qty
785740005	LC574 LINE INPUT CABLE	1001	1
900024	LCXXX POWER SUPPLY W/FAN		1
CD9610	COLOR DISPLAY ASSY (MODIFY)		1
CH599012012	"5-MINUTE EPOXY"		0
F9300-4	GPIB & RS232 INTERFACE CARD	1000	1
F9601-2	CONNECTOR BOARD	1002	1
F9601-6	FLOPPY DISK DR ASSY	1000	1
F9601-8	MAIN SWITCH BOARD	1001	1
FP9604X	FRONT PANEL ASSY 4 CHANNEL		1
FPLC574-3	MAIN CARD FRNT PANEL LC574XX (PEMS)	1002	1
RP9602-9X	REAR PANEL 9602-9		1
USLC574-3	UPPER SHIELD ASS'Y LC574	1002	1

900024: Power Supply

Lecroy Part Number	Description	Rev	Qty
235010005	DIODE RECTIFIER 1N4005		1
315116045	45W POWER SUPPLY -2V +/-6V		1
377051005	LABEL "DANGER ------ONLY"		1
377141000	LABEL MATRIX ADHESIVE PAPER		1
377900001	LABEL BARCODE 0.25" X 1.50"		1
455011002	CONTACT (CRIMP) MALE		2
455110002	BLOCK FOR MALE PINS 2 POS		1
520001006	LOCKIN NYLON P.C.BOARD SUPPORT		2
520014124	LOCKING NYLON PCB STANDOFF		6
530409406	FAN AXIAL 12V 3.1W 43 CFM		1
550010108	SCREW PAN HEAD PHIL M3X8 W/NYLOCK		7
550010706	SCREW ECO-FIX PHIL PAN M3X6 W/NYLOC		4
554035101	CLIP-ON NUT DIAM. 3.5		3
554440001	SCREW S/TAP PAN PHIL KA40X12		3
594120001	TIEWRAP		4
705740003	POWER SUPPLY CHASSIS		1
705740008	CABLE HARNESS FOR PSLC574-2		1
705740020	900024 POWER SUPPLY COVER		1
780834509	GROUND CABLE YELLOW/GREEN 9CM		1
785740001	CABLE PSLC574-2 TO PSI 1724		1

900024: Power Supply

Lecroy Part Number	Description	Rev	Qty
785740002	CABLE PSLC574-2 TO REAR PNL AC CABL		1
789384002	-2V SUPPLY LINE CABLE		1
935X-PS1225	POWER SUPPLY PS1724		1
PSLC574-2	LINE TRIG CARD &3.3V DC-DC CONV P/S		1

PSLC574-2 : Auxiliary Power Supply

Lecroy Part Number	Description	Rev	Qty
106435102	CAP CERA MONO .001UF		2
142824685	CAP TANT DIP CASE 6.8 UF		1
146544471	CAP MINI ALUM 20% 470 UF		1
146564227	CAP MINI ALUM 20% 220 UF		3
161225201	RES CARBON FILM 200 OHMS		1
161225511	RES CARBON FILM 510 OHMS		1
161335104	RES CARBON FILM 100 K		1
161335201	RES CARBON FILM 200 OHMS		1
161335271	RES CARBON FILM 270 OHMS		1
161445104	RES COMP 1/2W 5% 100 K		1
230110005	DIODE SWITCHING 1N4448		2
235010006	DIODE RECTIFIER 1N4006		1
240035333	DIODE ZENER 3.3V 1N5333A		1
260000111	OPTOISOLATOR H11L1		1
270110003	TRANSISTOR NPN PN2222A		1
270121003	TRANSISTOR PWR NPN MJE13003		1
315826501	PWR CONVERTER DC-DC 3.3VDC OUTPUT		1
454115003	HDR FRICTION LOCK 3		1
454115014	HDR FRICTION LOCK 14		1
454115103	HDR FRICTION LOCK 3X1-PIN		2
454810002	HDR FRICTION LOCK 2-PIN,RIGHT ANGLE		1
455021008	CONTACT (CRIMP) FEMALE		2
455123002	BLOCK FOR FEM PINS 2 POS		1
510140002	P.C. MOUNT SPADE LUG		1
590001022	WIRE TEFLON 7/30 BLK 22		0
590221022	WIRE TEFLON 7/30 RED 22		0
715740002	PCB PREASS'Y FOR PSLC574-2 PWR SPLY		1

RPLC574 : Rear Panel Assembly

Lecroy Part Number	Description	Rev	Qty
315972600	RFI FILTER W/DBL FUSE BLOCK		1
377000104	LABEL, CE & UL, TEST EQUIP.		1
405154002	CONN HOUSING 2-POS		1
405708001	TERMINAL ANTI-FISHHOOKING CRIMP		2
433162630	FUSE SLO-BLO 250V 6.30AMP		2
530409212	FAN AXIAL 12V 1"THK 2.4W		1
550010508	SCREW FLAT HEAD PHIL M3X8 W/NLOCK		2
550010706	SCREW ECO-FIX PHIL PAN M3X6 W/NYLOC		48
554035101	CLIP-ON NUT DIAM. 3.5		4
554440001	SCREW S/TAP PAN PHIL KA40X12		4
705740015	LABEL, PROTECTIVE GND SYMBOL		1
705740016	LABEL, LC574 FUSE DATA		1
705740017	SERIAL NUMBER PLATE FOR DSO		1
7093XX931	INTERF. HOLE CLOSURE 93XX-9		3
780834509	GROUND CABLE YELLOW/GREEN 9CM		1
RP9602-9X	REAR PANEL 9602-9		1

UCLCXXX : Upper Cover Assembly

Lecroy Part Number	Description	Rev	Qty
350150001	GASKET,ULTRAFLEX,PSA,6" X 0.25"DIA		1
350920024	MONEL MESH STRIP DIAM 2.4MM		28
380450012	NR ADHESIVE TAPE 4X12 MM		25
550011120	SCREW PAN HEAD PHIL M4X20 W/NYLOCK		2
709600040	9600 UPPER COVER		1
709600090	TIP-UP HANDLE		1

USLC574 : Upper Shield Assembly

Lecroy Part Number	Description	Rev	Qty
550010706	SCREW ECO-FIX PHIL PAN M3X6		3
554525901	CLIP DIAM 3.1MM		1
709600810	9600-8 POWER SWITCH BUTTON		1
709600820	9600-8 POWER SWITCH ROD		1
F9601-8	MAIN SWITCH BOARD	1001	1
USLC574-3	UPPER SHIELD ASS'Y LC574	1002	1

F9601-8 : Main Switch Assembly

Lecroy Part Number	Description	Rev	Qty
161445105	RES CARBON FILM 1 MEG		1
416121004	MAIN POWER SWITCH		1
454115103	HDR FRICTION LOCK 3X1-PIN		3
719601803	PC BD PREASS'Y FOR 9601-8		1

LCXXX-HD01 : Hard Disk Drive Assembly

Lecroy Part Number	Description	Rev	Qty
780891032	FLAT CABLE 2X20 (4 CONNECT)	A	1
F9300-8	PCMCIA III CONTROLLER	D	1

F9300-8 : Hard Disk Interface

Lecroy Part Number	Description	Rev	Qty
205750000	IC AND-OR GATE ARRAY 16V8		2
330100100	PCMCIA HEADER ASS'Y TOP/LEFT		1
389340009	AUTO-ADHES. RUBBER 12X4MM		1
454511040	HDR SOLD TAIL/MALE/40/RT		1
550120606	SCREW OVAL HD PHIL M2X6		4
550430106	SCREW CYL HD PHIL M3X6		4
551430400	WASHER SHAKEPROOF M3		4
552120100	NUT HEX M2X0.5D		4
594230002	CABLE CLIP ADHESIVE BACK		1
709300811	9300-8 PCMCIA III CONT.BRACKET	B	1
709300821	9300-8 PCMCIA III CONT. COVER	B	1
709300831	9300-8 PCMCIA III CONTR. LABEL	A	1
719300803	PC BD PREASS'Y 9300-8	B	1
CH599011002	LOCTITE SCREW LOCK GLUE		1
SM200178002	IC 2-INPUT NOR HCT02		1
SM200178374	IC D-TYP FLOP 74HCT374		2
SM201178175	IC QUAD D FLIP/FLOP 74HCT175		1
SM206885245	IC BUS TRANSCVR ABT245		1
SM207170036	IC HEX BUFFER 3-ST. PC74HCT365		3
SM208470358	IC DUAL OP AMP 358D		1
SM208780109	IC MICROPOWER DC-DC CONV.		1
SM232032814	DIODE 2814		3
SM275330858	TRANSISTOR PNP BC858C		1
SM280171005	TRANS MOSFET MTD10N05E		1
SM300056332	INDUCTOR WOUND 33 UH		1
SM652101102	RES CHIP (E24) 1% 1 K		3

F9300-8 : Hard Disk Interface

Lecroy Part Number	Description	Rev	Qty
SM652101103	RES CHIP (E24) 1% 10 K		18
SM652101104	RES CHIP (E24) 1% 100 K		1
SM652101122	RES CHIP (E24) 1% 1.2 K		1
SM652101220	RES CHIP (E24) 1% 22 OHMS		1
SM652101334	RES CHIP (E24) 1% 330 K		1
SM652101511	RES CHIP (E24) 1% 510 OHM		1
SM652101513	RES CHIP (E24) 1% 51 K		1
SM654101000	CHIP JUMPER ZERO OHMS		1
SM661207103	CAP CERA CHIP 20% .01UF (0805)		11
SM661207104	CAP CERA CHIP 20% .1 UF		6
SM666327225	CAP MOLD TANT CHIP 2.2 UF		1
SM666377226	CAP MOLD TANT CHIP 22 UF		3

LCXXX-GP01 : Graphic Printer Assembly

Lecroy Part Number	Description	Rev	Qty
334000402	THERMAL PAPER FOR SEIKO PRINTER		1
334000832	THERMAL PRINTER UNIT		1
350150001	GASKET,ULTRAFLEX,PSA,6" X 0.25"DIA		1
350920024	MONEL MESH STRIP DIAM 2.4MM		28
380450012	NR ADHESIVE TAPE 4X12 MM		25
389340008	AUTO-ADHESIVE RUBBER BAND 12X2MM		3
530040005	SLIDE LATCH TAB STYLE		2
550010105	SCREW PAN HEAD PHIL M3X5 W/NYLOCK		6
550010106	SCREW PAN HEAD PHIL M3X6 W/NYLOCK	1001	4
550011120	SCREW PAN HEAD PHIL M4X20 W/NYLOCK		2
551430100	FLAT WASHER M3		3
551430400	WASHER SHAKEPROOF M3		4
552430300	NUT OPEN-END ACORN M3		3
594120003	TIEWRAP		2
709450523	PUSH SWITCH EXTENDER		1
709600090	TIP-UP HANDLE		1
709601010	GP01 OPTION UPPER COVER		1
709601020	GRAPHIC PRINTER FRAME		1
70GP01041	GRAPHIC PRINTER COVER AXLE		1
70GP01051	GRAPHIC PRINTER CUTTER		1

LCXXX-GP01 : Graphic Printer Assembly

Lecroy Part Number	Description	Rev	Qty
70GP01061	GRAPHIC PRINTER SWITCH BUTTON		1
780721022	FLAT CABLE 2X10 (22CM)		1
780791604	FLAT CABLE 2X13 (4CM)		1
BOX-GP01	GP01 GRAPHIC PRINTER BOX		1
COVER-GP01	GP01 GRAPHIC PRINTER COVER		1
F9300-7	PRINTER CONTROLLER	1005	1

LC574-CKTRIG Option : External Clock, External Reference and Trigger Out

Lecroy Part Number	Description	Rev	Qty
550010706	SCREW ECO-FIX PHIL PAN M3X6 W/NYLOC		2
594120001	TIEWRAP		2
594220026	MICRO WIRE CLIP, SIDE ENTRY		1
709350331	935X-CKTRIG PANEL		1
709350341	10MHZ EXT REF LABEL		1
709350351	500MHZ EXT CLK LABEL		1
709350361	TRIG COMP OUT LABEL		1
780881135	CABLE COAX 50 OHM, MCA-BNC		3
93XX-CKTRIG-OM	- CKTRIG OPERATOR'S MANUAL		1

F9300-7 : Printer Controller

Lecroy Part Number	Description	Rev	Qty
146544471	CAP MINI ALUM 20% 470UF		1
147494472	CAP ALU COMPACT AXIAL 4700 UF		1
190042103	RESISTOR NETWORK 10 K		1
190042472	RESISTOR NETWORK 4.7 K		2
207140007	IC QUAD STEP MOTOR DRIVER		1
208122002	IC VOLT REG POS UA7805		2
208590350	IC ADJ POWER REG 3A LM350		1
309380016	CRYSTAL OSC (PROGR) 16 MHZ		1
416161003	SWITCH PUSHBUTTON SPST		1
430430002	RELAY 1 FORM C SPDT		1
454111002	HEADER STRAIGHT 2-PINS		1
454111006	HEADER STRAIGHT 6-PINS		1
454113003	HEADER STRAIGHT 3-PINS		1
454121003	BLOC FOR SOCKETS 3-PIN		1
454511020	HDR SOLD TAIL/MALE 20		1

F9300-7 : Printer Controller

Lecroy Part Number	Description	Rev	Qty
454511026	HDR SOLD TAIL/MALE 26		1
554435401	RIVET "RIVSCREW" M 3.5		3
719300703	PC BD PREASS'Y 9300-7	F	1
SM200330125	IC QUAD BUFFER 74HC125		1
SM207470175	IC QUAD DIFF LINE RECEIVER		4
SM208580336	IC REF DIODE LM336-2.5V		1
SM208650393	IC DUAL VOLT COMP LM393M		1
SM227080500	IC THERM PRINTER GATE ARRAY		1
SM227090501	IC THERM PRINTER CPU		1
SM236030099	DIODE SO-PKG BAV99		8
SM270330848	TRANSISTOR NPN BC848C		2
SM652101101	RES CHIP (E24) 1% 100 OHM		12
SM652101102	RES CHIP (E24) 1% 1 K		1
SM652101103	RES CHIP (E24) 1% 10 K		26
SM652101104	RES CHIP (E24) 1% 100 K		1
SM652101132	RES CHIP (E24) 1% 1.3 K		3
SM652101151	RES CHIP (E24) 1% 150 OHM		1
SM652101162	RES CHIP (E24) 1% 1.6 K		2
SM652101201	RES CHIP (E24) 1% 200 OHM		1
SM652101223	RES CHIP (E24) 1% 22 K		1
SM652101301	RES CHIP (E24) 1% 300 OHM		3
SM652101302	RES CHIP (E24) 1% 3 K		1
SM652101303	RES CHIP (E24) 1% 30 K		1
SM652101391	RES CHIP (E24) 1% 390 OHM		1
SM652101472	RES CHIP (E24) 1% 4.7 K		4
SM652101510	RES CHIP (E24) 1% 51 OHMS		1
SM652101513	RES CHIP (E24) 1% 51 K		1
SM652101514	RES CHIP (E24) 1% 510 K		1
SM652101563	RES CHIP (E24) 1% 56 K		2
SM652101621	RES CHIP (E24) 1% 620 OHM		2
SM652101682	RES CHIP (E24) 1% 6.8 K		1
SM654101000	CHIP JUMPER ZERO OHMS		2
SM661127104	CAP CERA CHIP 20% .1 UF		2
SM661207103	CAP CERA CHIP 20% .01UF (0805)		23
SM661255101	CAP CERA CHIP 5% 100 PF		1
SM661255471	CAP CERA CHIP 5% 470 PF		4

UCLCGP01 : GPO1 Upper Cover

Lecroy Part Number	Description	Rev	Qty
350150001	GASKET,ULTRAFLEX,PSA,6" X 0.25"DIA		1
350920024	MONEL MESH STRIP DIAM 2.4MM		28
380450012	NR ADHESIVE TAPE 4X12 MM		25
389340008	AUTO-ADHESIVE RUBBER BAND 12X2MM		3
550011120	SCREW PAN HEAD PHIL M4X20 W/NYLOCK		2
709600090	TIP-UP HANDLE		1
709601010	GP01 OPTION UPPER COVER		1

PP094 : 4GS/s Adapter

Lecroy Part Number	Description	Rev	Qty
554425003	SCREW S/TAP PHIL M2.5X6 BLACK		6
554425005	SCREW TAPTITE M2.5X6		4
7093XXP41	PROBE HOLDER		1
7093XXP53	PROBE FRAME		2
7093XXP91	PROBE RING CONTACT		1
70PP09400	PP094 LEFT LABEL	1000	1
70PP09401	PP094 RIGHT LABEL	1002	1
BOX-PP092	PP092 BOX		1
FPP094	4GS/S ADAPTOR FOR 9384	1000	1

BOX-PP092 : Box for PP092

Lecroy Part Number	Description	Rev	Qty
554420501	RETAINING PIN 2 X 18		3
554425005	SCREW TAPTITE M2.5X6		4
70PP09211	PP092 FRONT PANEL		1
70PP09221	PP092 LEFT SHELL		1
70PP09231	PP092 RIGHT SHELL		1
70PP09241	PP092 SPACER		1

FPP094 : Adapter Board

Lecroy Part Number	Description	Rev	Qty
454340002	HDR SOLD TAIL/WW 2		1
7093XXP01	RIGHT ANGLE RECEPT. CONNECTOR		1
7093XXP11	RIGHT ANGLE PIN CONNECTOR		2
7093XXP21	BULKHEAD RECEPTACLE FEMALE BNC		1
7093XXP31	CONN BULKHEAD MALE BNC		2
71PP09400	PP094 P.C. PREASS'Y		1
SM205108002	IC EEPROM 2K BIT IIC BUS		1
SM240218451	DIODE ZENER BZX84C5V1		1
SM653101251	RES CHIP 1% 33.2 OHMS		6
SM653101339	RES CHIP 1% 274 OHMS		1
SM653101410	RES CHIP 1% 1.50 K		1
SM653101489	RES CHIP 1% 10.0 K		1
SM661207103	CAP CERA CHIP 20% .01 UF		1

Accessories

Lecroy Part Number	Description	Rev	Qty
433162630	FUSE SLO-BLO 250V 6.30AMP		2
530500017	BOOK CASE FOR LCXXX		1
589203218	AC CORD/US-CANADA PLUG		1
597574011	ACCESSORY CARTON W/URETHANE INSERT		1
597574012	PE FOAM END-CAPS(PAIR) FOR LCXXX		1
597574013	MASTER CARTON FOR LCXXX SHIPPING		1
597940014	PLASTIC BAG FOR 94XX & 93XX		1
598761004	RECLOSABLE 2 MIL BAG 3" X 5"		1
700009002	REGISTRATION CARD INTERNATIONAL VER		1
700009003	REGISTRATION CARD DOMESTIC VERSION		1
700101100	LABEL, OSCILLOSCOPE BOX	1000	1
709600015	LCXXX PROTECTIVE COVER		1
CALIB-DE1	CALIBRATION DOCUMENT ENVELOPE	1000	1
LCXXX-HG-E	HANDS ON GUIDE FOR LCXXX SCOPES		1
LCXXX-OM-E	OPERATORS MANUAL FOR LCXXX SCOPES		1

Accessories

Lecroy Part Number	Description	Rev	Qty
LCXXX-RM-E	REMOTE CNTRL MANUAL FOR LCXXX SCOPE		1
LCXXX-WP01	ADVANCED WAVEFORM MATH PACKAGE		0
LCXXX-WP02	SPECTRUM ANALYSIS PACKAGE		0
LCXXX-WP03	HISTOGRAMS PACKAGE		0
LCXXX-WP03-OM-E	STATIST. ANALYS. PACK. MANUAL		1
LCXXXCECERT	DECLARATION OF CONFORMITY LCXXX		2
PP005	PROBE 10 MOHM 10:1 500V 500MHZ		4
PP094	4GS/S ADAPTER FOR 9384/LC574	1000	1

8. Mechanical Parts

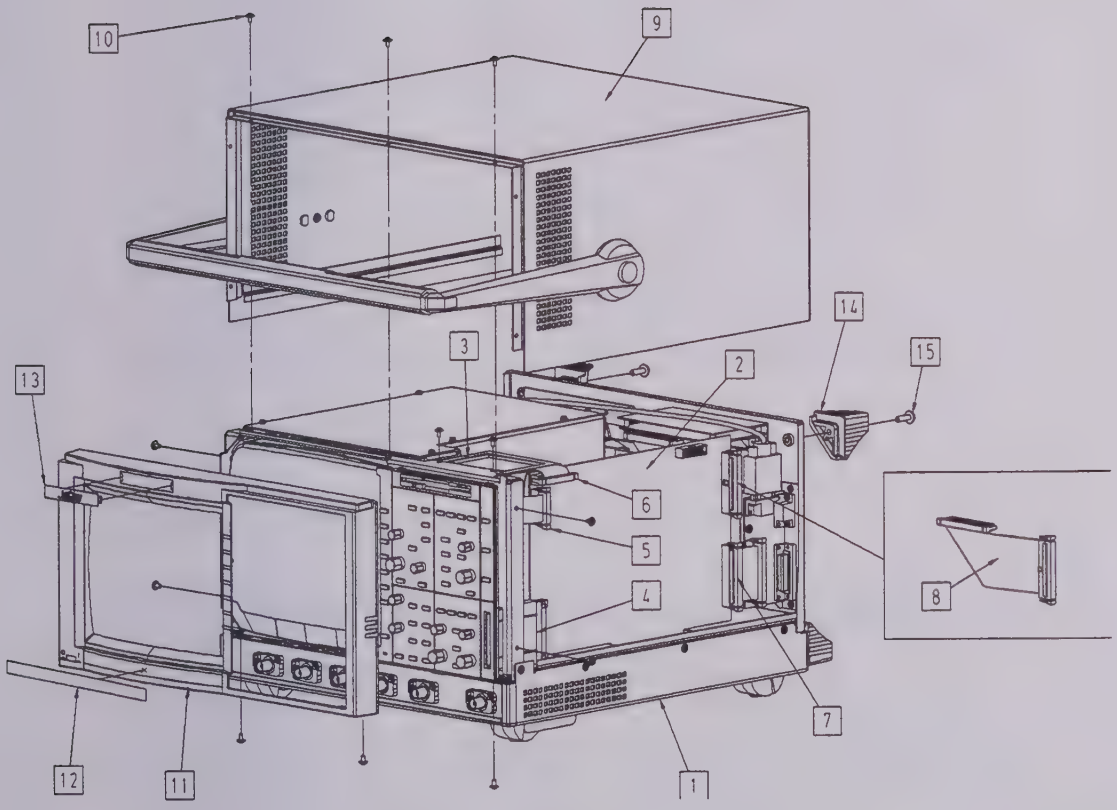


Figure 8-1 : LC574A Cabinet

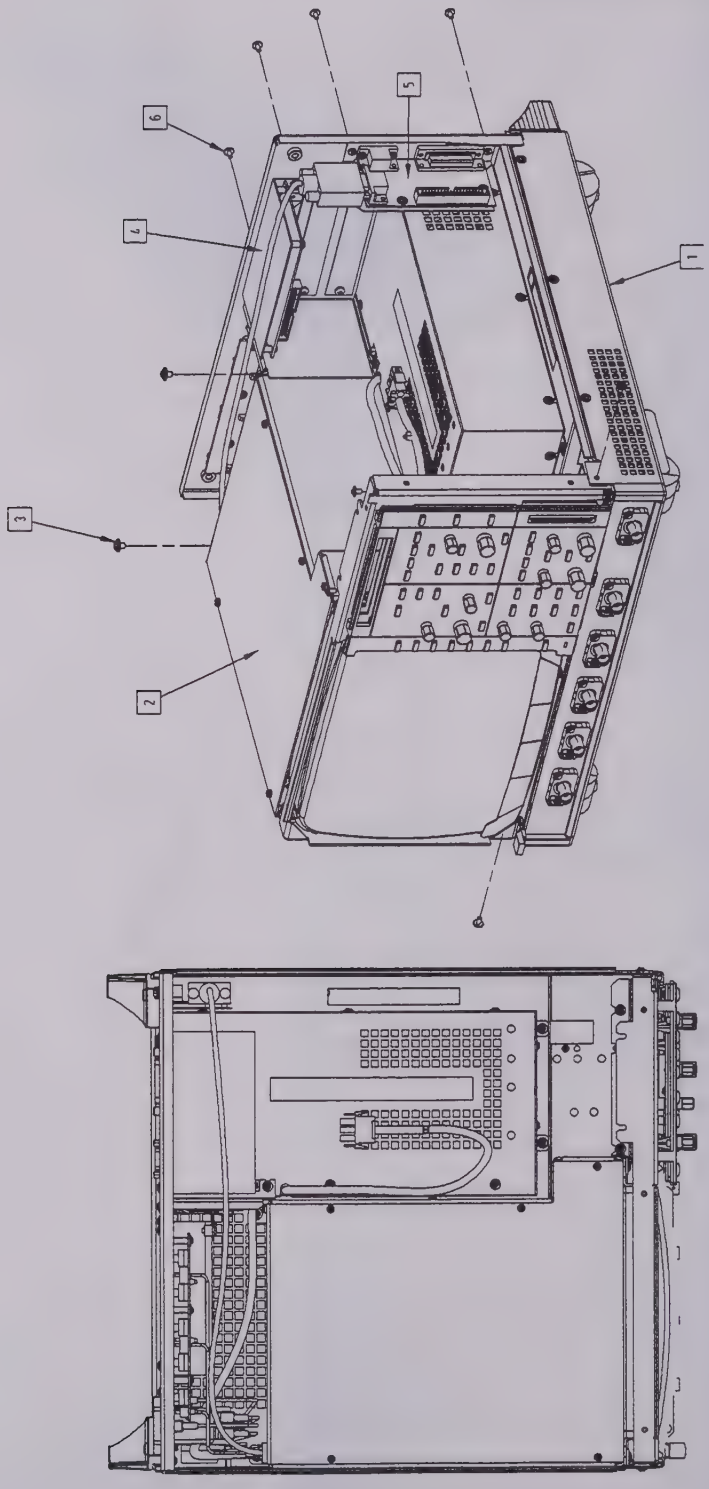


Figure 8-2 : LC574A Assembly

LC574A Cabinet Replaceable Parts (Figure 8-1)

Item	LeCroy Part Number	Qty	Description
1	LCXXX	1	Lower Cover Assembly
2	F9601-1-8 for LC574A	1	Processor Board
2	F9601-1-8 for LC574AM	1	Processor Board
2	F9601-1-64 for LC574AL	1	Processor Board
3	F9601-6	1	Floppy Disk Drive Assembly
4	709424096	1	Insertion Guide for Memory Card
5	780721105	1	Flat Cable 2X10 (5,5 cm)
6	780991606	1	Flat Cable 2X13 (6 cm)
7	780981003	1	Flat Cable 2X20 (3,5 cm)
8	780981032	1	Flat Cable 2X20 (4 connector)
9	UCLCXXX-GP01	1	LCXXX Upper Cover Assembly
10	550010706	12	Screw eco-fix M3x6 w/Nylock
11	709600010	1	9600 Bezel
12	705740301	1	LC574A Front Label
12	705740302	1	LC574AM Front Label
12	705740303	1	LC574AL Front Label
13	709600050	1	LeCroy Logo
14	709600075	2	9600 Rear Foot
15	550151116	2	Screw Pan Hd Phil M5x16
16	709600078	2	Rear Foot Rubber

LC574A Assembly Replaceable Parts (Figure 8-2)

Item	LeCroy Part Number	Qty	Description
1	LCXXX	1	Lower Cover Assembly
2	CD9610	1	Monitor Assembly
3	550010705	2	Screw eco-fix M4x5 w/Nylock
4	F9300-4	1	GPIB & RS232 Interface Card
5	F9601-2	1	Centronics & VGA Interface Card
6	550010706	8	Screw eco-fix M3x6 w/Nylock

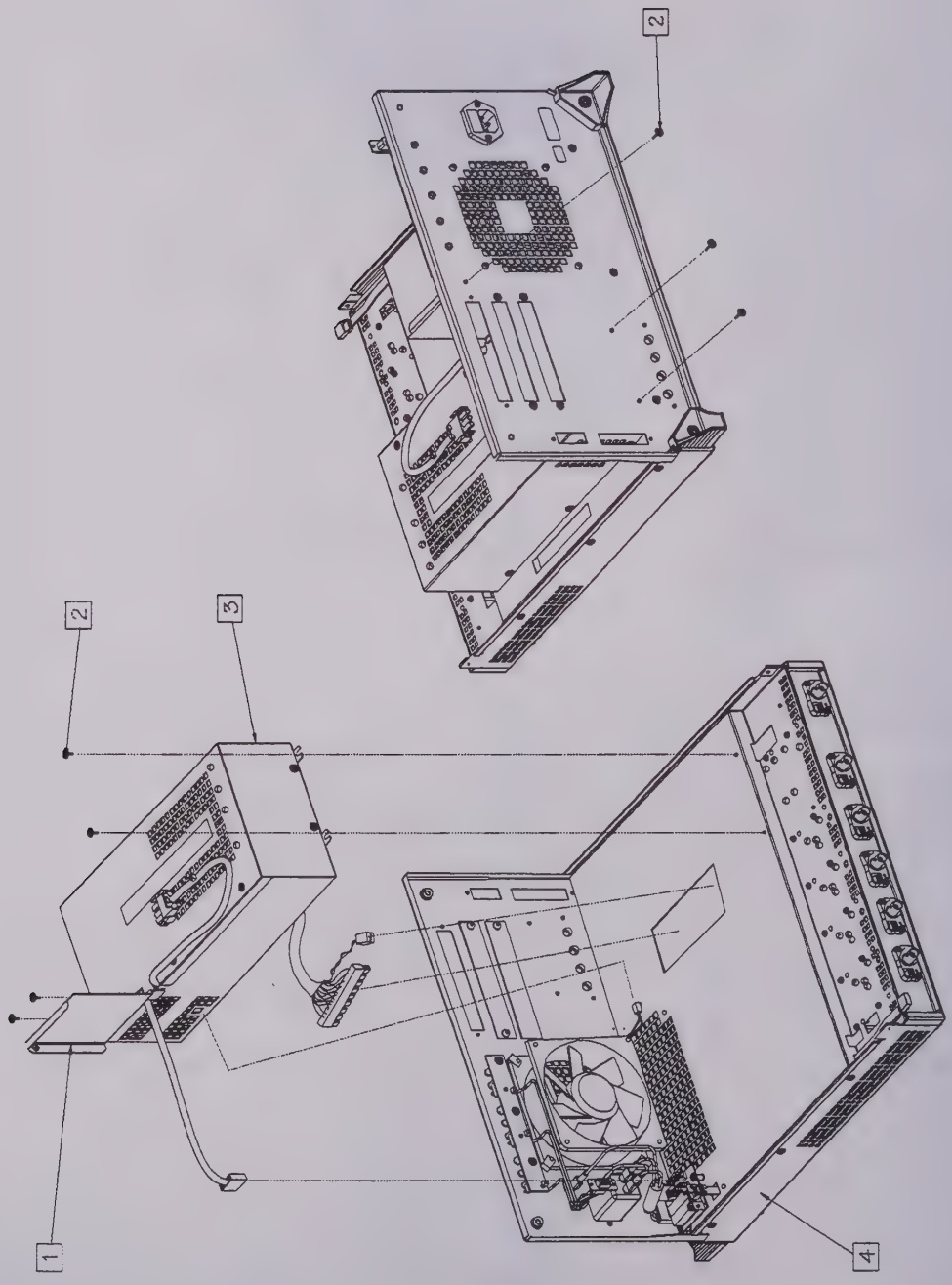


Figure 8-3 : LC574A Chassis

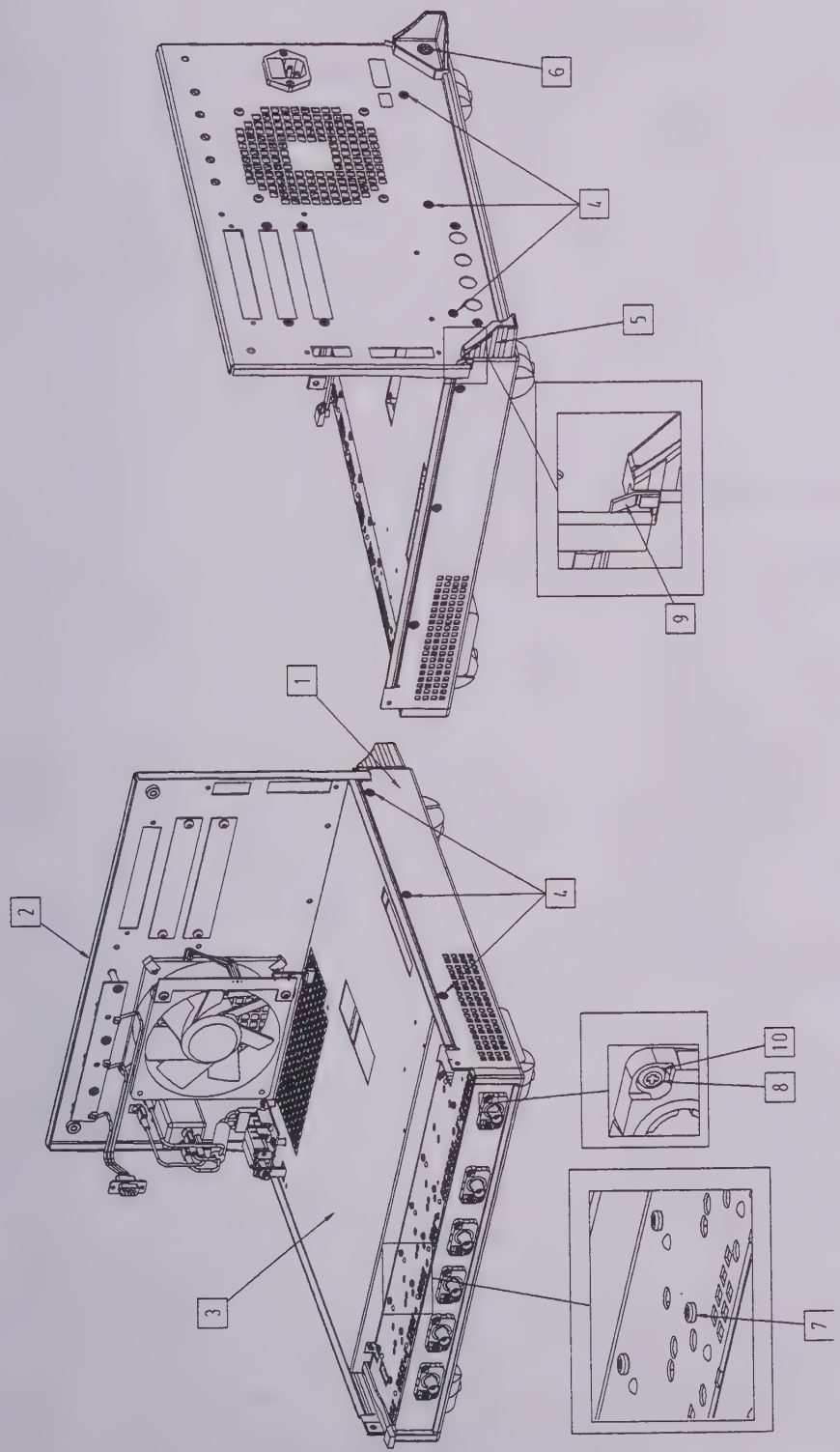


Figure 8-4 : LC574A Lower Cover

LC574A Chassis Replaceable Parts (Figure 8-3)

Item	LeCroy Part Number	Qty	Description
1	705740013	1	Top partition LC574
2	550010706	7	Screw eco-fix M3x6 w/Nylock
3	900024	1	Power Supply w Fan
3	PSLC574	1	Power Supply w/o Fan
4	LCXXX	1	Lower Cover Assembly
5	USLC574-3	1	Upper Shield Assy LC574

LC574A Lower Cover Replaceable Parts (Figure 8-4)

Item	LeCroy Part Number	Qty	Description
1	LCXXX	1	Lower Cover Assembly
2	RPLC574	1	Rear Panel Assembly
3	USLC574-3	1	Upper Shield
4	550010706	9	Screw eco-fix M3x6 w/Nylock
5	709600070	2	Rear Foot
6	550151116	2	Screw eco-fix M5X16 w/Nylock
7	550010130	12	Screw cyl hd phil M3X30 w/ Nylock
8	550011106	6	Screw pan hd M2X6 black w/Nylock
9	709600048	2	Lock Spring
10	551620100	6	Flat Washers steel/black
11	709600078	2	Rear Foot Rubber

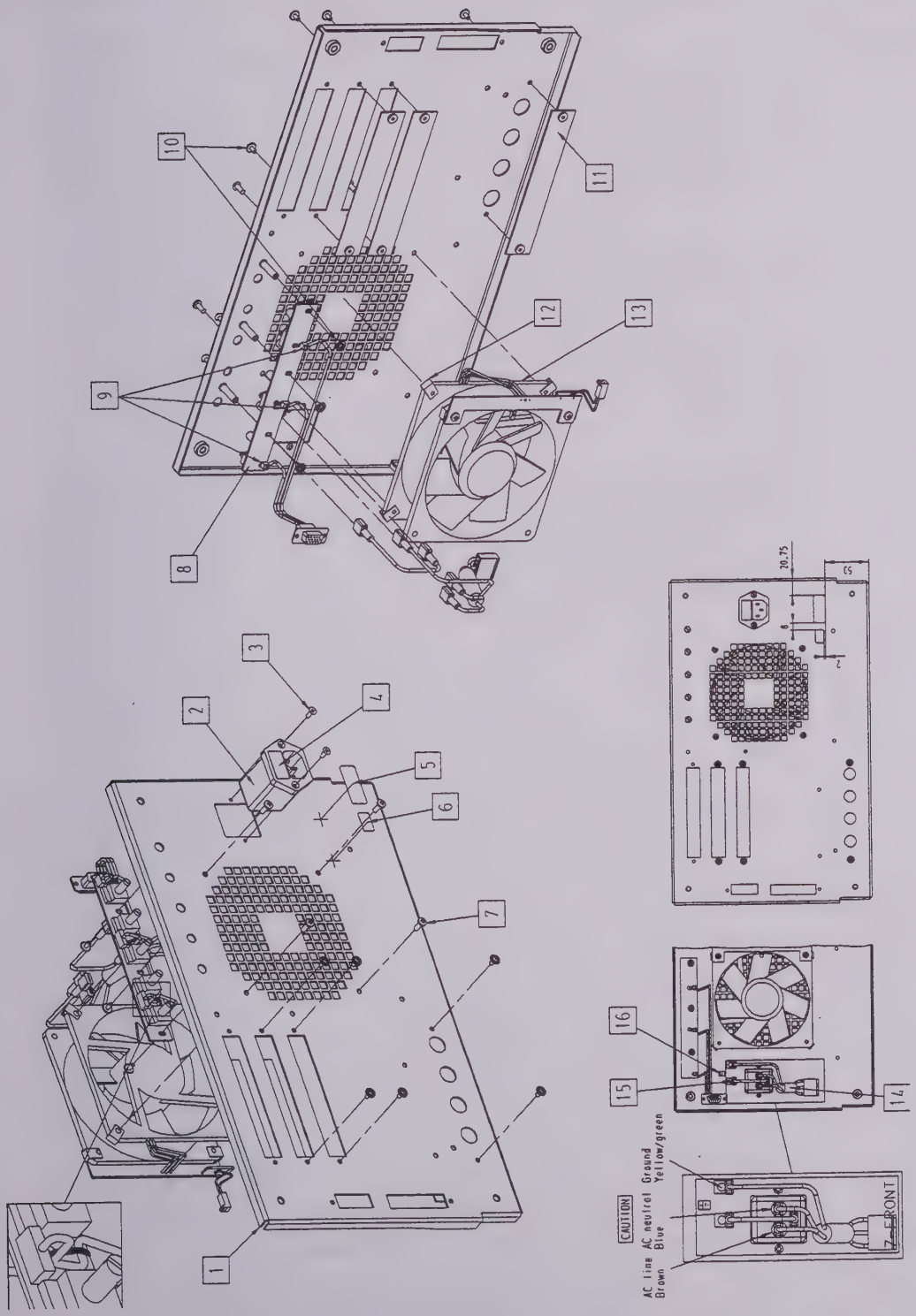


Figure 8-5 : LC574A Rear Panel Assembly

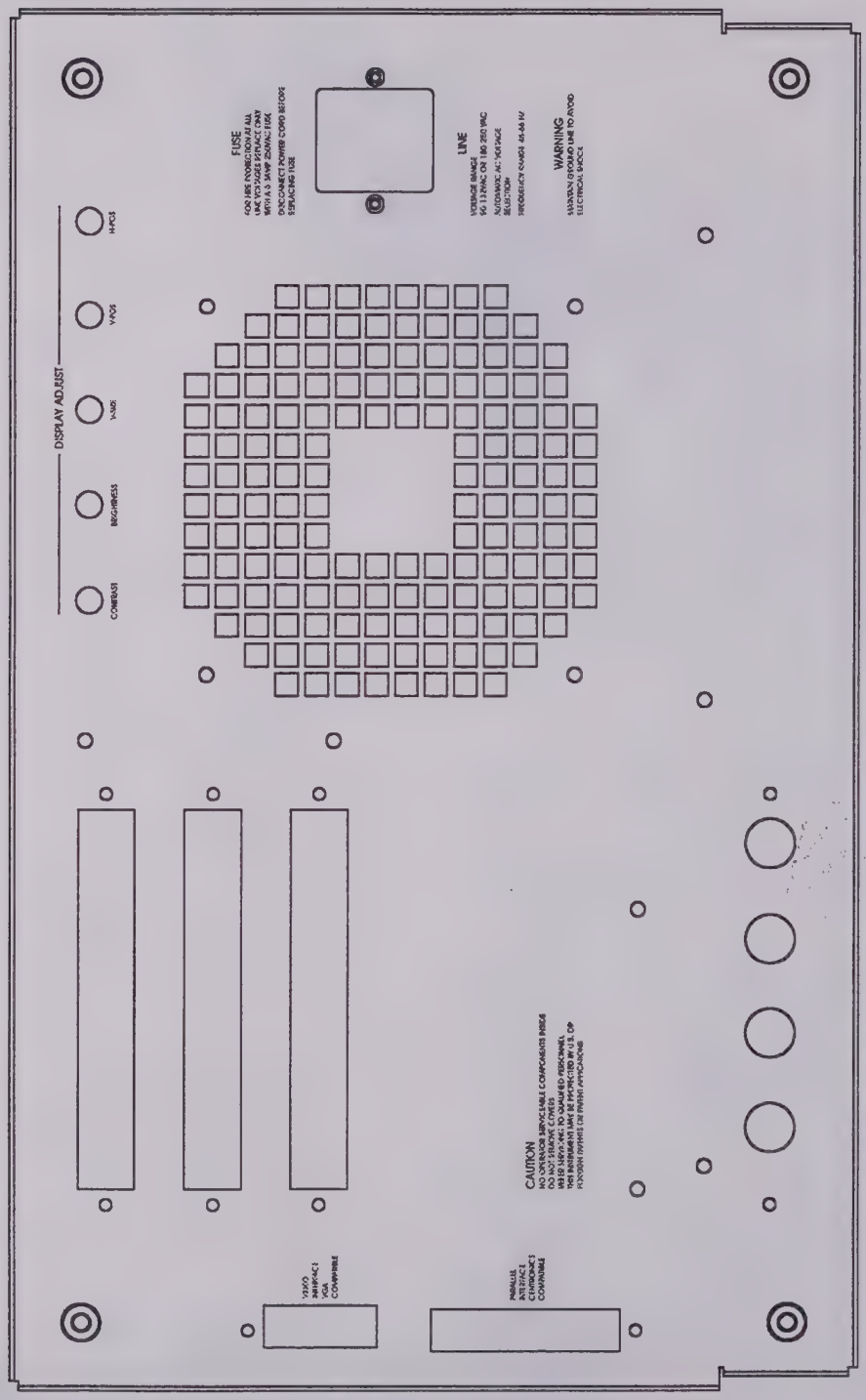
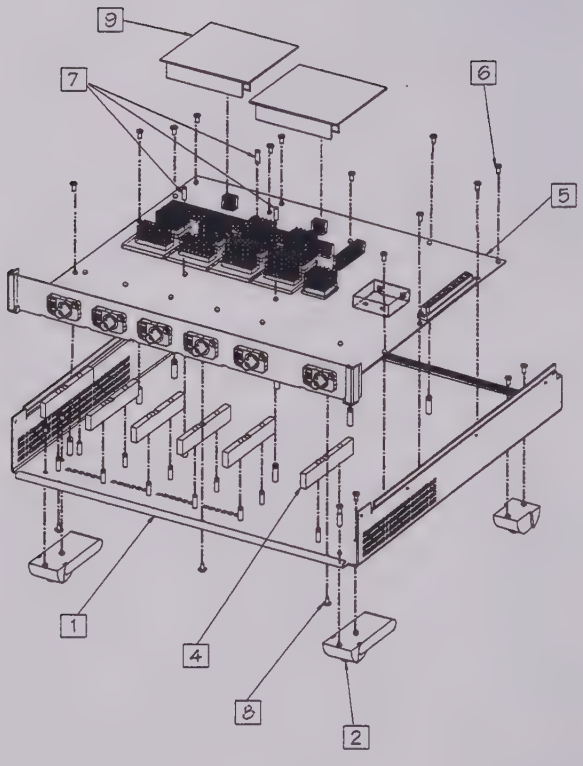


Figure 8-6 : LC574A Rear Panel

LC574A Rear Panel Replaceable Parts (Figure 8-5)

Item	LeCroy Part Number	Qty	Description
1	RP9602-9	1	Rear Panel
2	315972600	1	Line input Filter
3	550010508	2	Screw flat hd phil M3X8 w/ Nylock
4	433162630	2	Fuse slow-blo 6.3A/250 V
5	705740017	1	Serial Number Plate
6	377000104	1	CE Label
7	554440001	4	Screw pt phil KA40X12 w/Nylock
8	CD9610-1	1	CD9610 Adjustment Board
9	594120006	3	Tiewrap
10	550010706	9	Screw eco-fix M3X6
11	7093XX931	3	Interface Hole Closure
12	554035101	4	Clip on nut diam 3.5
13	530409212	1	Fan Axial 12V 1" Thick 2.4 W
14	785740005	1	Line Input cable
15	780834509	1	Ground Cable yellow/green 9 cm
16	705540015	1	Label Ground Symbol
17	705740016	1	Label Fuse Data



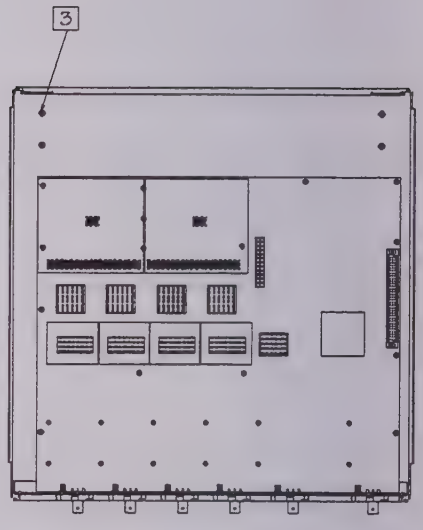


Figure 8-7 : LC574A Main Board Assembly

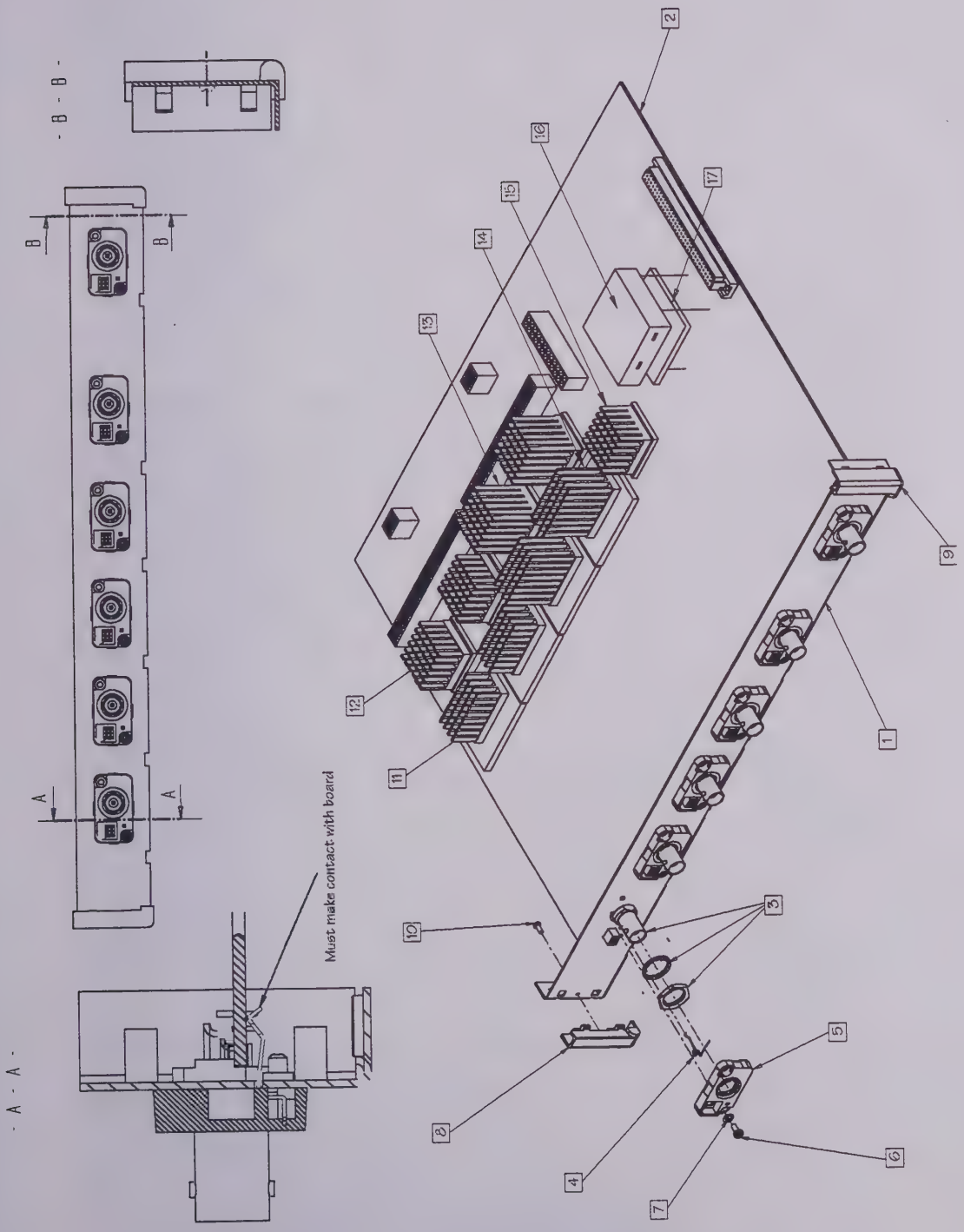


Figure 8-8 : LC574A Main Board

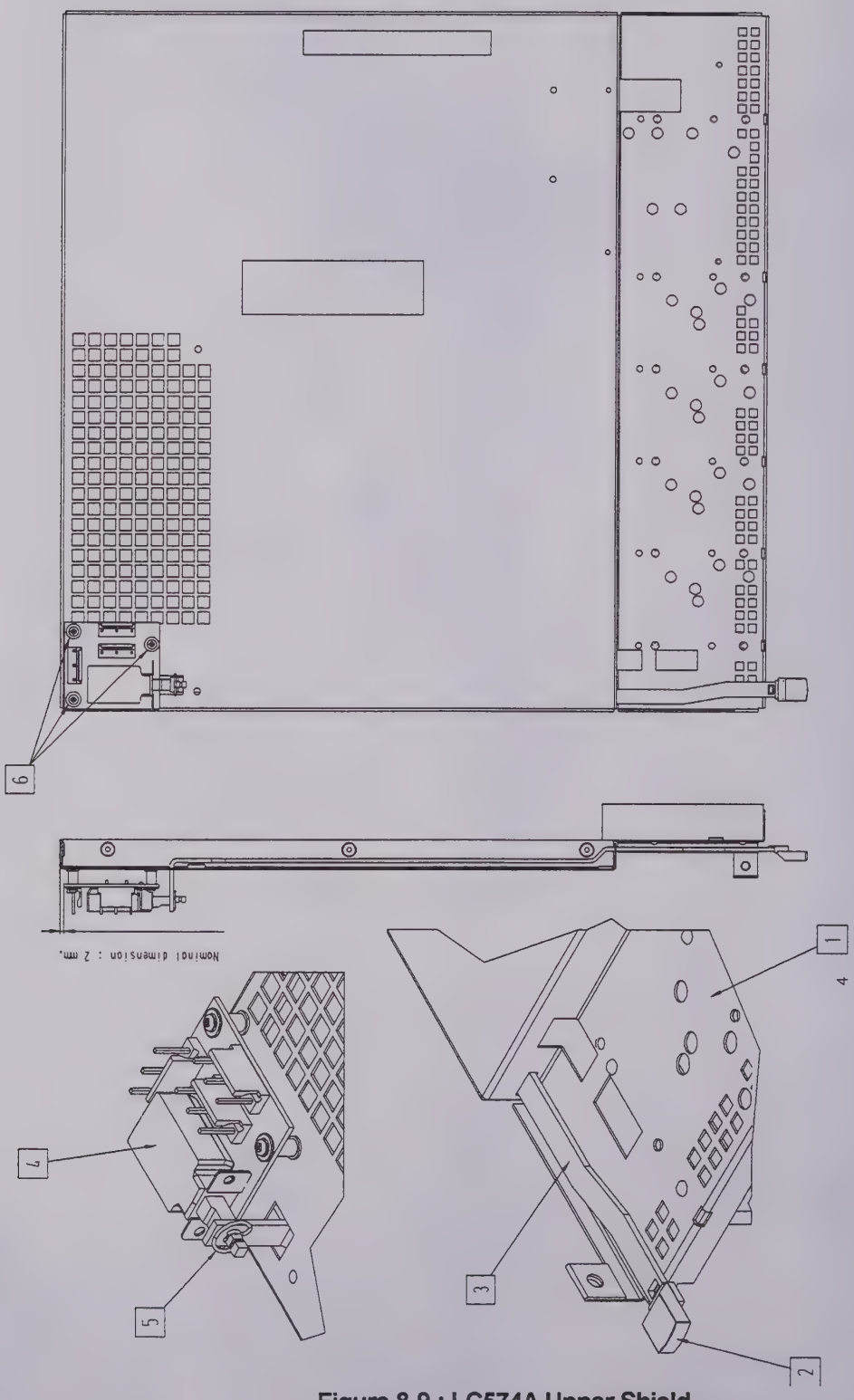


Figure 8-9 : LC574A Upper Shield

LC574A Main Board Assembly Replaceable Parts (Figure 8-7)

Item	LeCroy Part Number	Qty	Description
1	705740038	1	Lower Cover LCXXX Dual Fan
2	485325001	1	Set of 4 Feet dark grey
3	554435006	8	Screw pt phil KA35X7
4	709674351	6	Shield Lower Partition
5	F9394-31 or 900022	1	Main Board
6	554430401	12	Screw with lockwasher M3X6
7	524010037	3	Standoff M3 37MMx4.5MM Hex w/Nylock
8	550010706	3	Screw eco-fix M3X6 w/Nylock
9	9384M-2	2	Acquisition Memory 2X100k, LC574A
9	9384M-2	2	Acquisition Memory 2X500k, LC574AM
9	9384MEM-2	2	Acquisition Memory 2X2G, LC574AL

LC574A Main Board Replaceable Parts (Figure 8-8)

Item	LeCroy Part Number	Qty	Description
1	FPLC574-3	1	Main Card Panel LC574XX
2	F9384-31 or 900022	1	Main Card
3	7093XXP21	6	Bulkhead Receptacle Female BNC
4	7093XXP91	6	Probe Ring Contact
5	7093XXP41	6	Probe Holder
6	554425003	6	Screw Pan Head M2X6 black w/ Nylock
7	551620100	6	#2 Flat Washer S. Steel, Black Oxide
8	709600024	1	Left Hub Cap
9	709600020	1	Right Hub Cap
10	554422006	2	Screw Self Tapping KA22X5
11	505121002	2	Heatsink 1.5"X.65", .8" High
12	505121003	2	Heatsink 1.1"X1.0", .8" High
13	709384013	2	Heatsink 24X23X32H
14	709384014	2	Heatsink 42X25X32H
15	505121004	1	Heatsink .9"X1.0", .8" High
16	709354411	1	9354-4 Oscillator Shield
17	F9354-4	1	400-500 MHz PLL Oscillator

LC574A Upper Shield Replaceable Parts (Figure 8-9)

Item	LeCroy Part Number	Qty	Description
1	USLC574-3	1	Upper Shield Assembly
2	709600810	1	Main Switch Button
3	709600820	1	Power Switch Rod
4	F9601-8	1	Main Switch
5	554525901	1	Clip diam 3.1 mm
6	550010706	3	Screw eco-fix M3X6

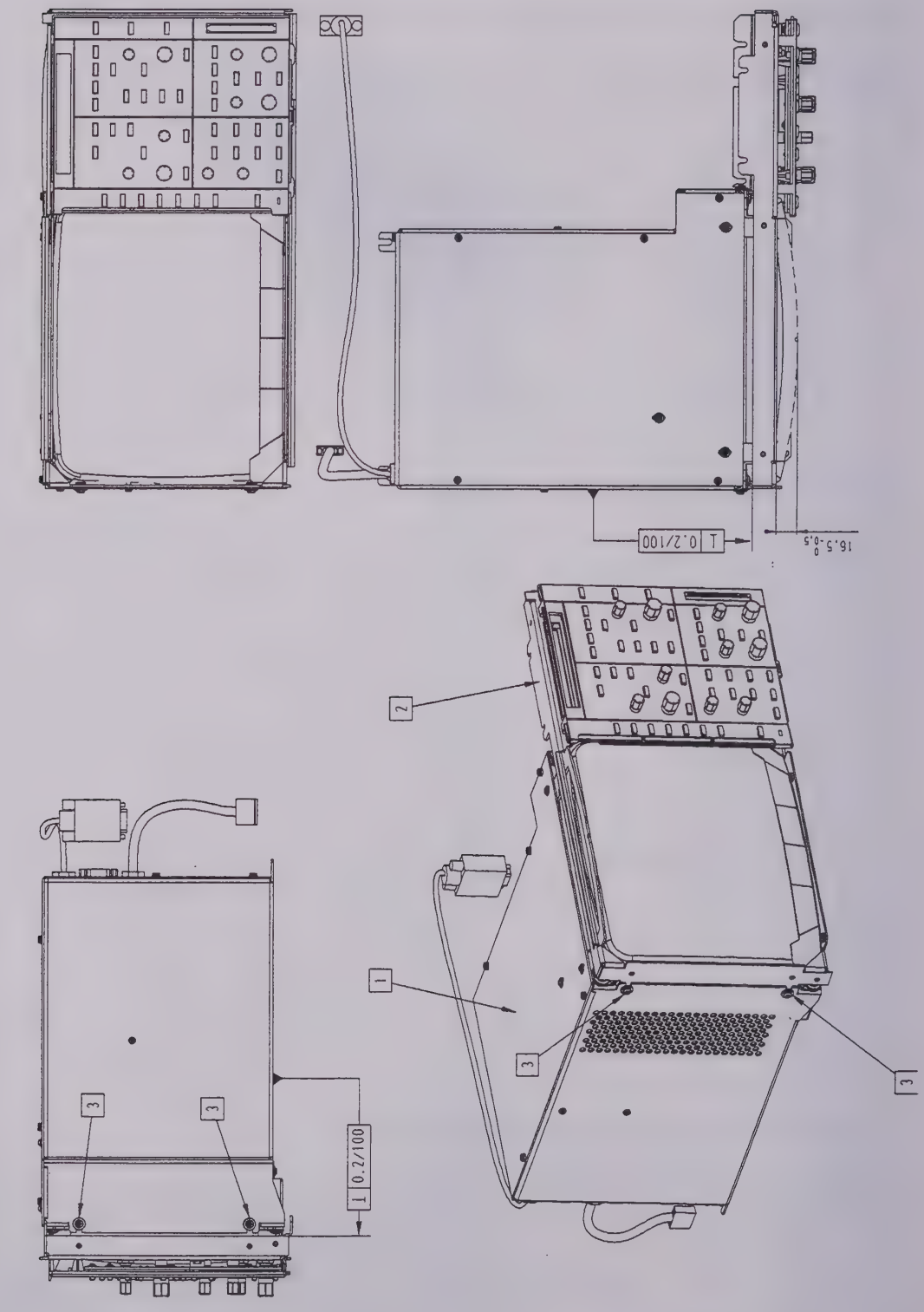


Figure 8-10 : LC574A Monitor and Frame Assembly

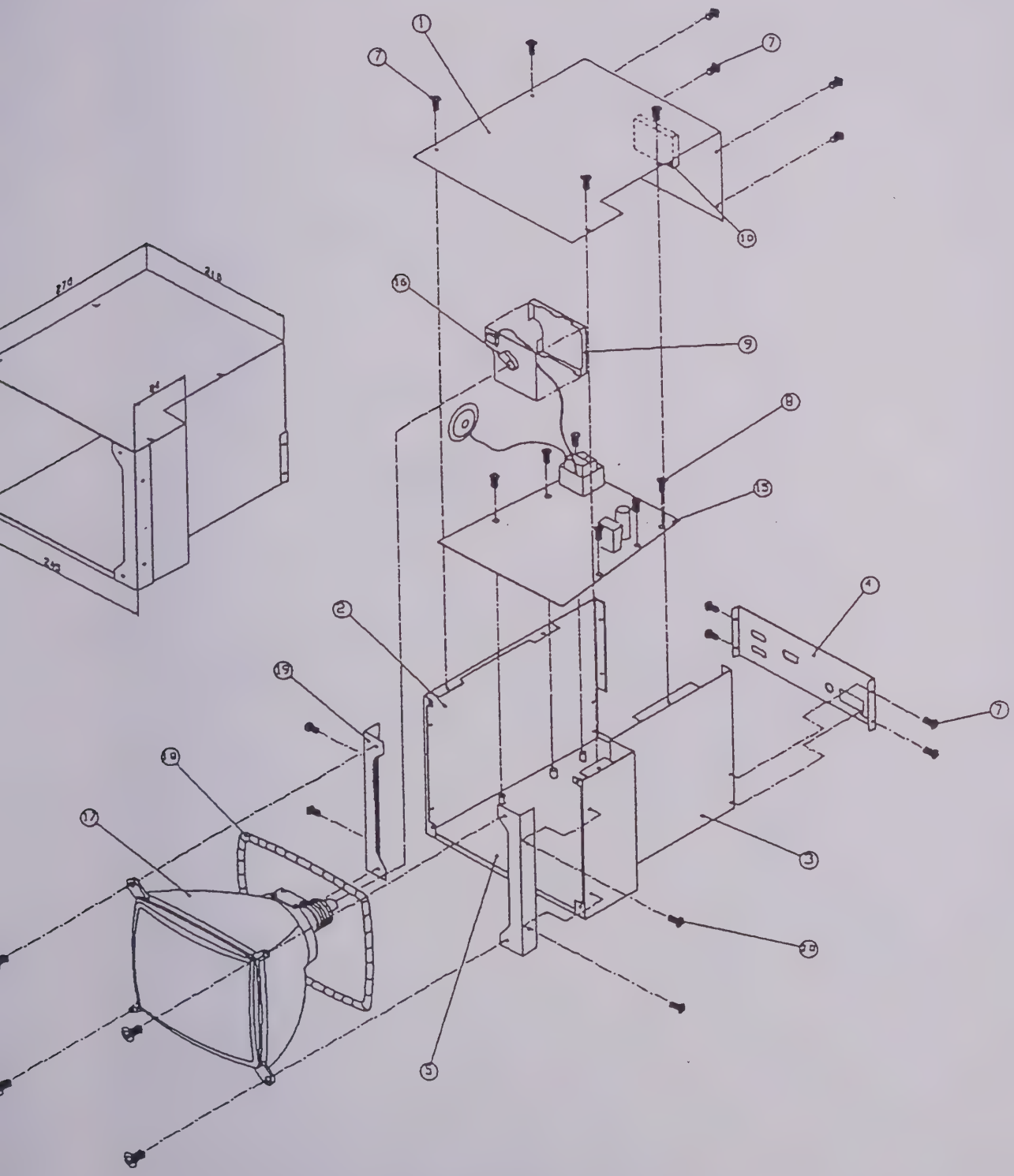


Figure 8-11 : CD9600 Monitor Assembly

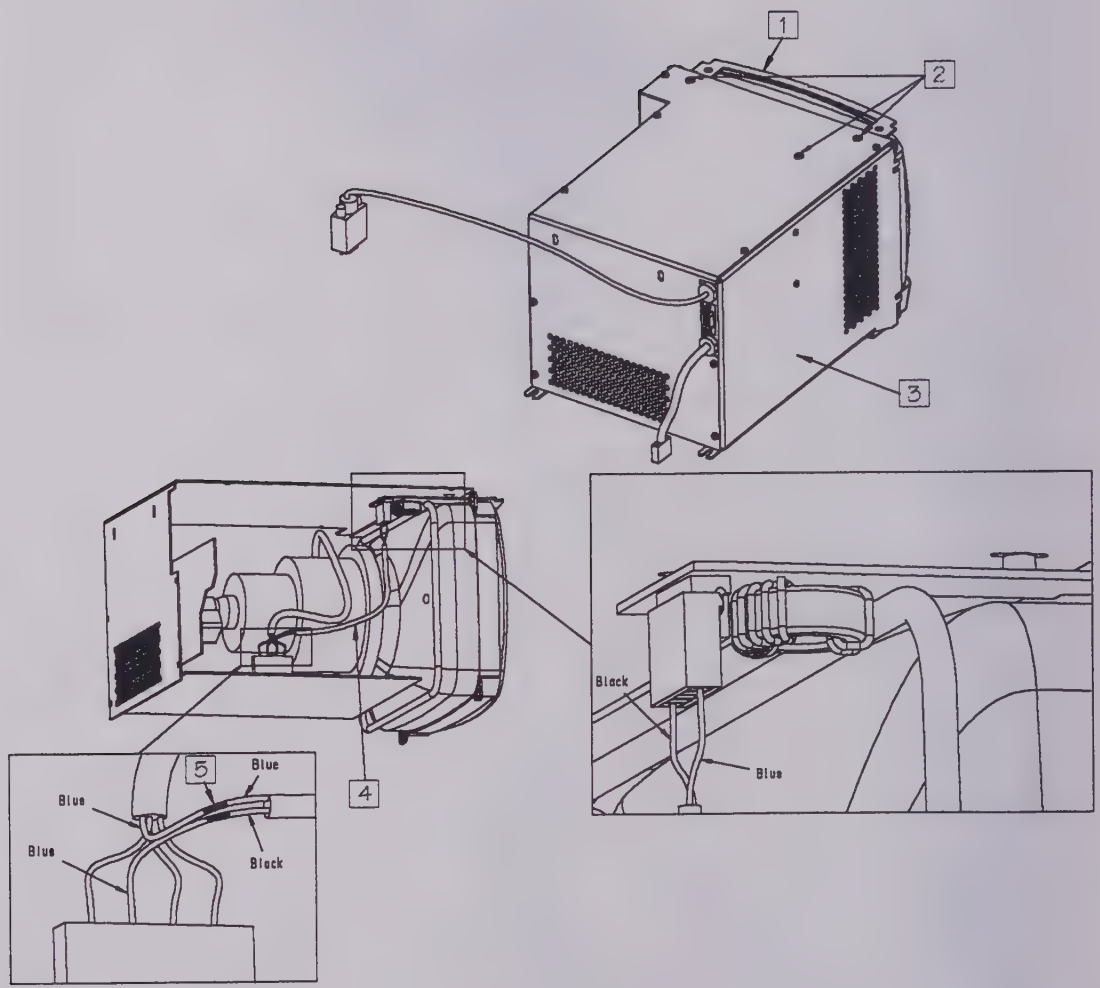


Figure 8-12 : CD9610 Monitor Assembly

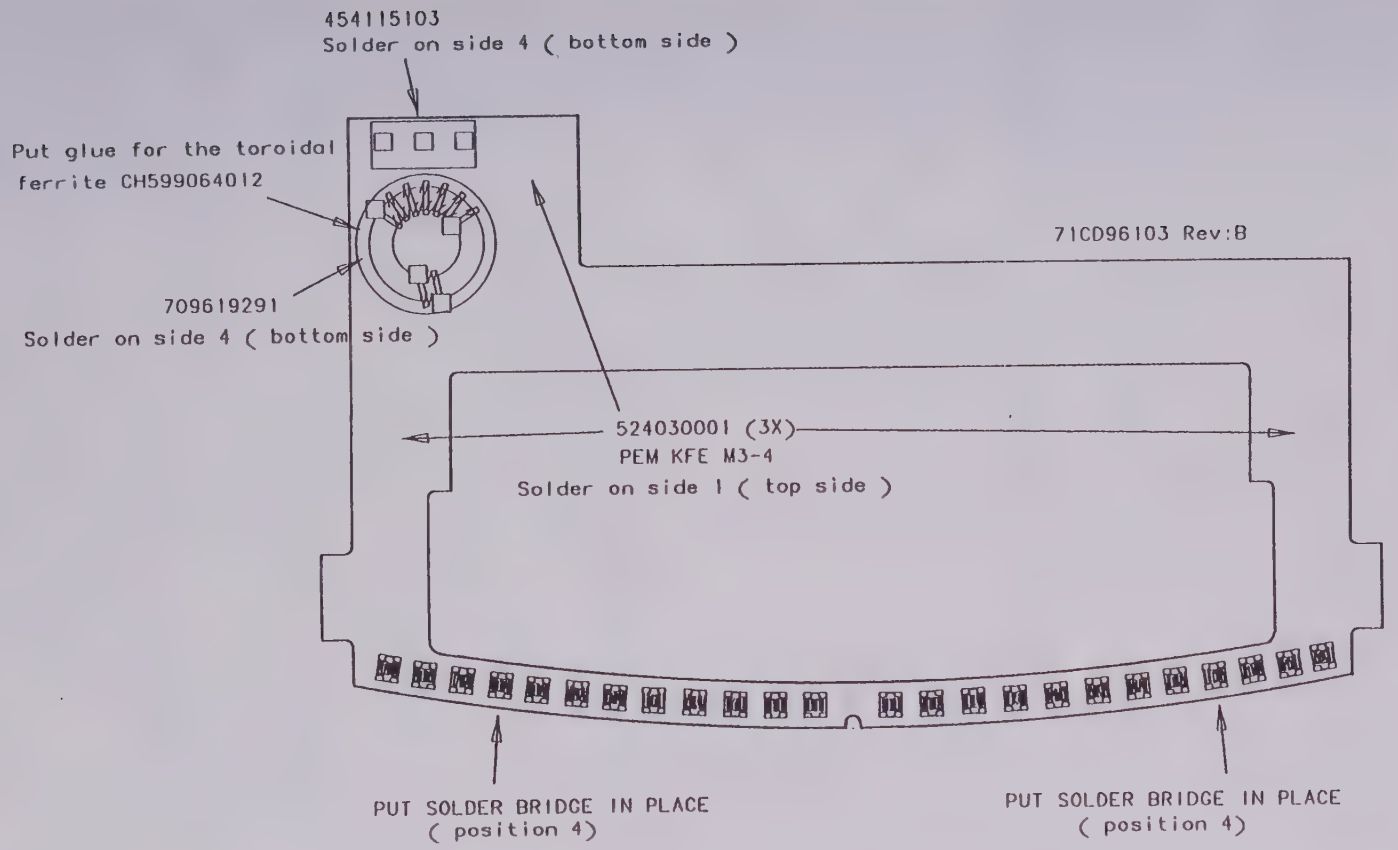
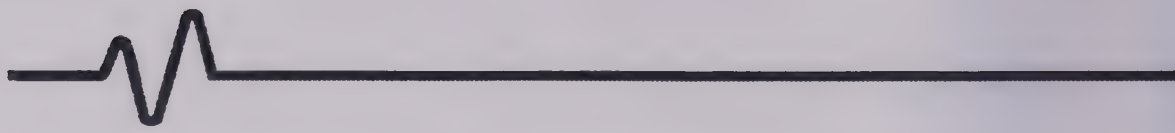


Figure 8-13 : CD9610 Magnetic Field Cancellation Coil



LC574A Monitor and Frame Replaceable Parts (Figure 8-10)

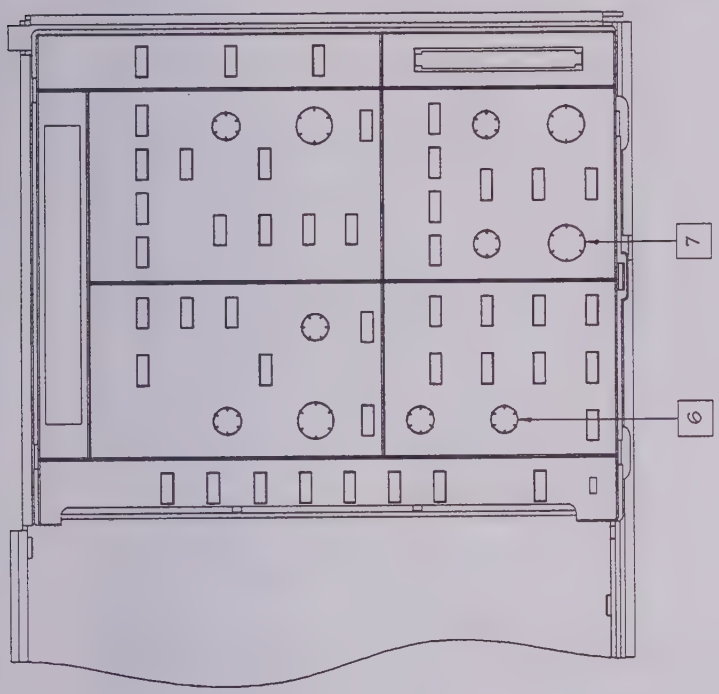
Item	LeCroy Part Number	Qty	Description
1	CD9610	1	Color Display Monitor Assembly
2	FP9604	1	Front Panel Assembly
3	550010705	4	Screw eco-fix M4X5 w/Nylock

LC574A Monitor and Frame Replaceable Parts (Figure 8-11)

Item	Part Number	Qty	Description
1	30150160126	1	Top Cover
2	30150161122	1	Left Cover
3	30150161129	1	Right Cover
4	30150161124	1	Rear Cover
5	30150171128	1	Base Assembly
6	3SM4010CCF3	4	Screw M4X10
7	3SM4008WBB2	12	Screw M4X8
8	3SM3006WBS1	6	Screw M3X6
9	30150168127	1	CRT PWB Bracket
10	30181069119	1	Foam
15	393T35M1002	1	Main board
16	393T35C1007	1	CRT Board
17	33311000247	1	CRT 10 "
18	36080111538	1	Degaussing
19	30150165128	2	CRT Holder
20	3SM4008WBB2	4	Screw M4X8

CD9610 Color Monitor Replaceable Parts (Figure 8-12)

Item	LeCroy Part Number	Qty	Description
1	CD9610-2	1	Magnetic Coil
2	550010706	3	Screw eco-fix M3X6
3	CD9600	1	Color Display Monitor Assembly
4	781010018	1	Cable Assembly
5	595603218	2	Heat Shrink Sleeving



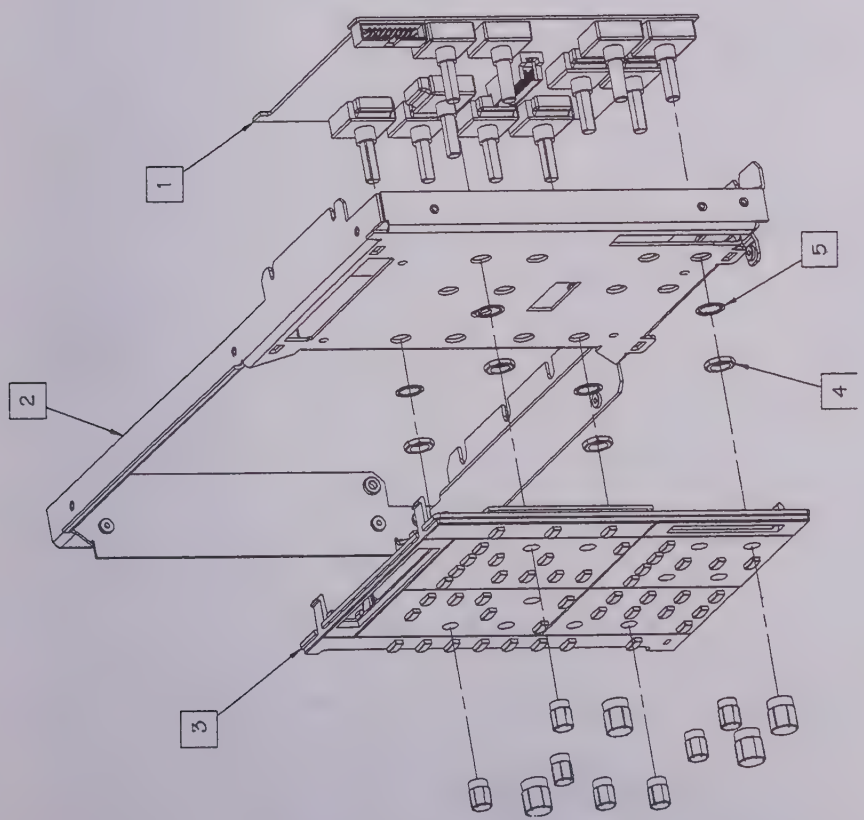


Figure 8-14 : LC574A Front Panel Assembly

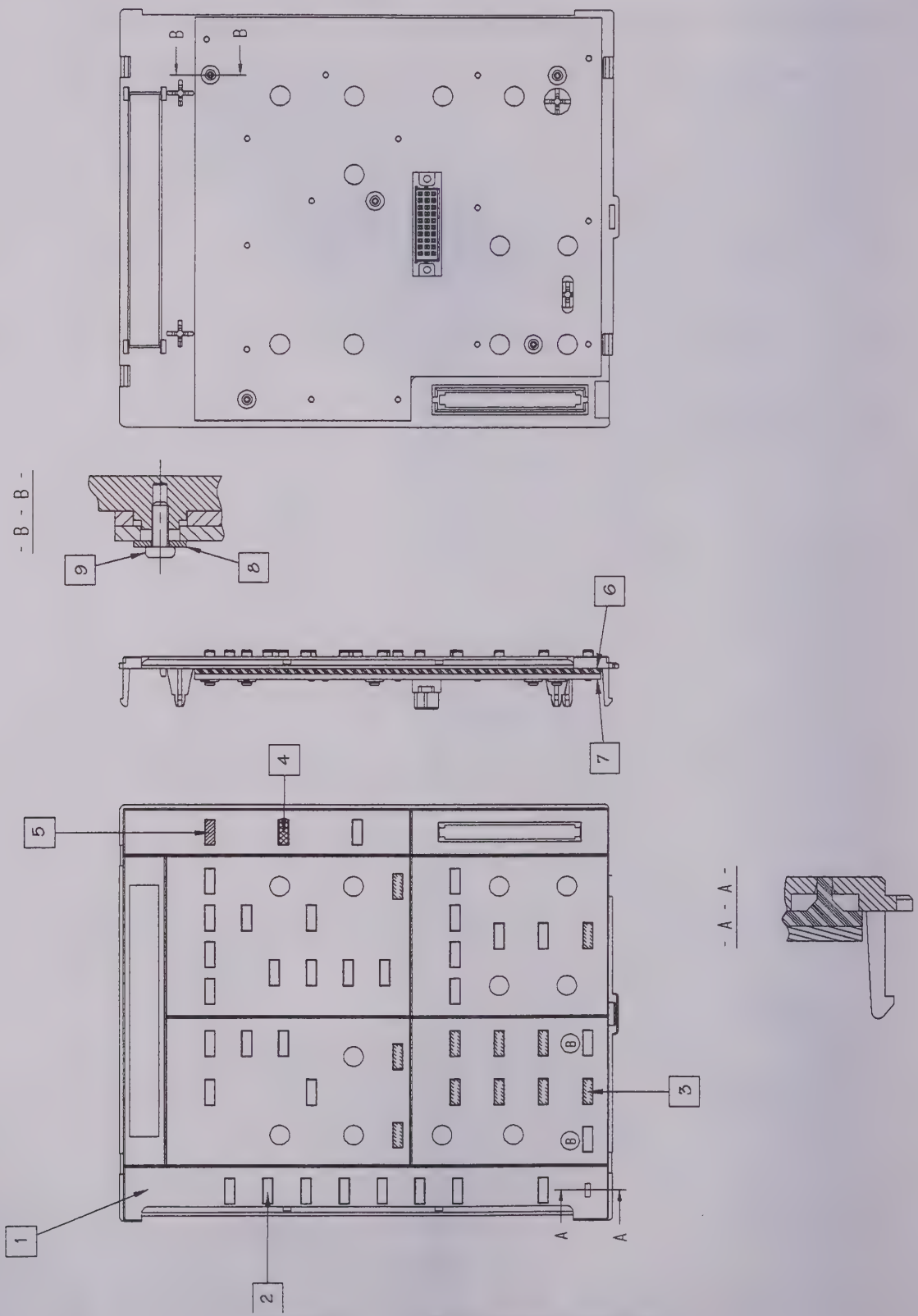


Figure 8-15 : LC574A Keypad Assembly

LC574A Front Panel Replaceable Parts (Figure 8-14)

Item	LeCroy Part Number	Qty	Description
1	F9604-5	1	Quad Channel Front Panel
2	709600030	1	Front Frame
3	F9602-5	1	Keypad Front Panel
4	552090075	4	Mounting Nut M9X0.75
5	551090001	4	Lockwasher M9
6	709600560	7	Knob diam 9
7	709600570	4	Knob diam 12

LC574A Keypad Replaceable Parts (Figure 8-15)

Item	LeCroy Part Number	Qty	Description
1	709600534	1	Front Panel Plate
2	709960510	32	Switch Cap, Light Grey
3	709600512	11	Switch Cap, Dark Grey
4	709600516	1	Switch Cap, Green
5	709600514	1	Switch Cap, Blue
6	709600550	1	Rubber Mat
7	S9602-5	1	PCB Assembly
8	551423100	5	Flat Washer M2.3
9	554422005	5	Screw Self Tapping KA22X6

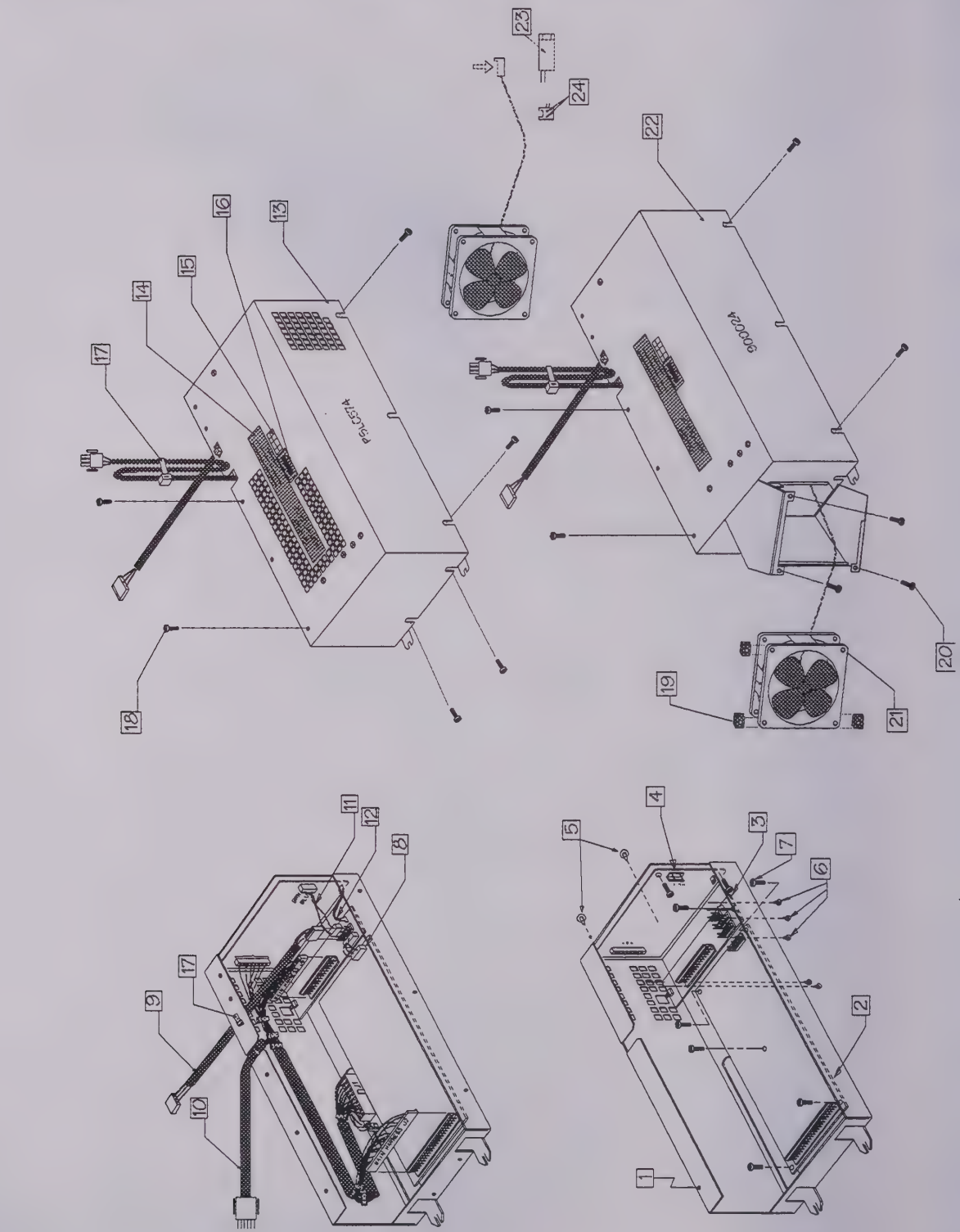


Figure 8-16 : LC574A Power Supply Assembly

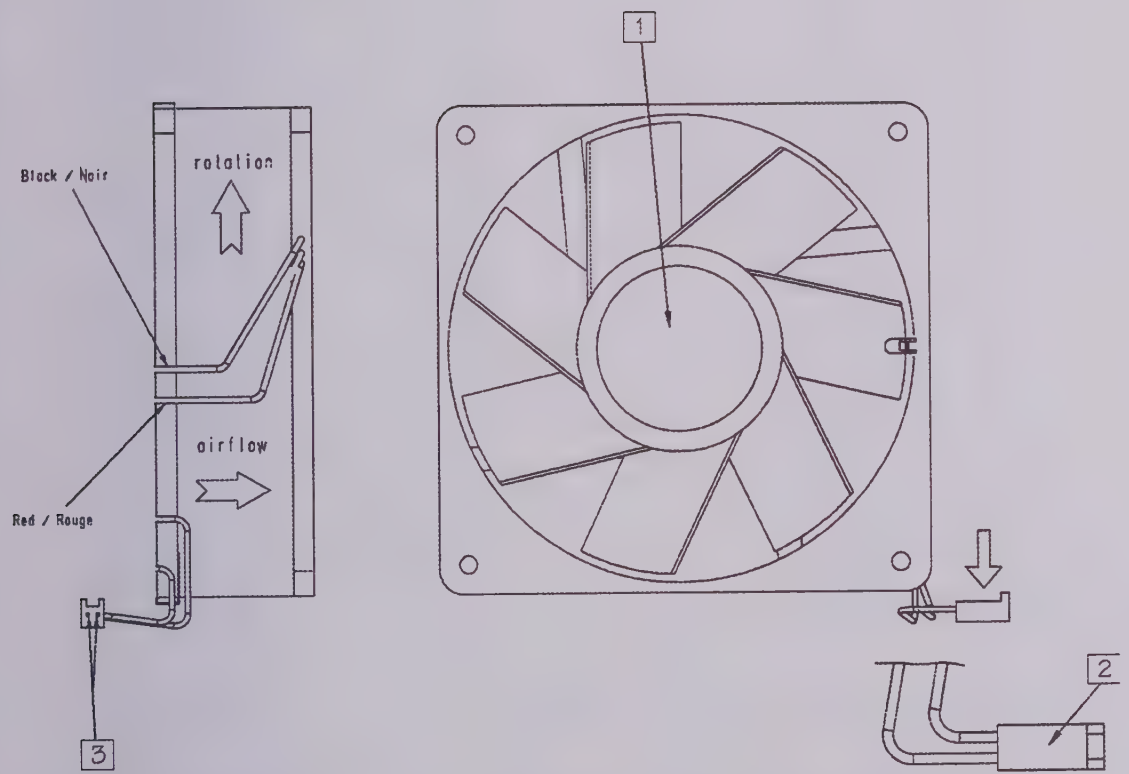
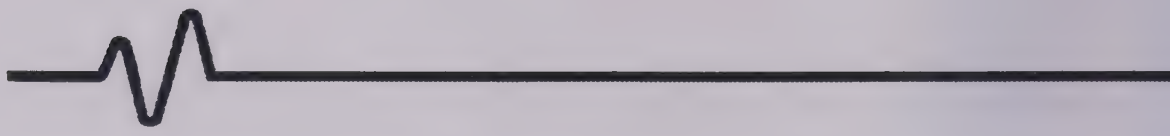


Figure 8-17 : LC574A Fan Assembly



LC574A Power Supply Replaceable Parts (Figure 8-16)

Item	LeCroy Part Number	Qty	Description
1	705740003	1	Power Supply Chassis
2	935X-PS1225	1	Power Supply Ps1724
3	PSLC574-2	1	Line Trig Card &3.3v Dc-Dc Conv P/S
4	315116045	1	45w Power Supply -2v +/-6v
5	520001006	2	Lockin Nylon P.C.Board Support
6	520014124	6	Locking Nylon Pcb Standoff
7	550010108	7	Screw Pan Head Phil M3x8 W/Nylock
8	785740001	1	Cable Pslc574-2 To Psi 1724
9	785740002	1	Cable Pslc574-2 To Rear Pnl Al Cabl
10	705740008	1	Cable Harness For Pslc574-2
11	789384002	1	-2v Supply Line Cable
12	780834509	1	Ground Cable Yellow/Green 9cm
14	377051005	1	Label "Danger -----Only"
15	377141000	1	Label Matrix Adhesive Paper
16	377900001	1	Label Barcode 0.25" X 1.50"
17	594120001	4	Tiewrap
18	550010706	4	Screw Eco-Fix Phil Pan M3x6 W/Nyloc
19	554035101	3	Clip-On Nut Diam. 3.5
20	554440001	3	Screw S/Tap Pan Phil Ka40x12
21	530409406	1	Fan Axial 12v 3.1w 43 Cfm
22	705740020	1	900024 Power Supply Cover
23	455011002	2	Contact (Crimp) Male
24	455110002	1	Block For Male Pins 2 Pos
25	235010005	1	Diode Rectifier 1n4005

LC574A Fan Replaceable Parts (Figure 8-17)

Item	LeCroy Part Number	Qty	Description
1	530409212 (used with unit with 900024 Power supply)	1	Fan Axial 12V 1" Thick 2.4W
1	530409006 (used with unit with PSLC574 power supply)	1	Fan Axial 12 V
2	405154002	1	Connector Housing 2 Pos
3	405708001	2	Terminal anti-fishhook crimp

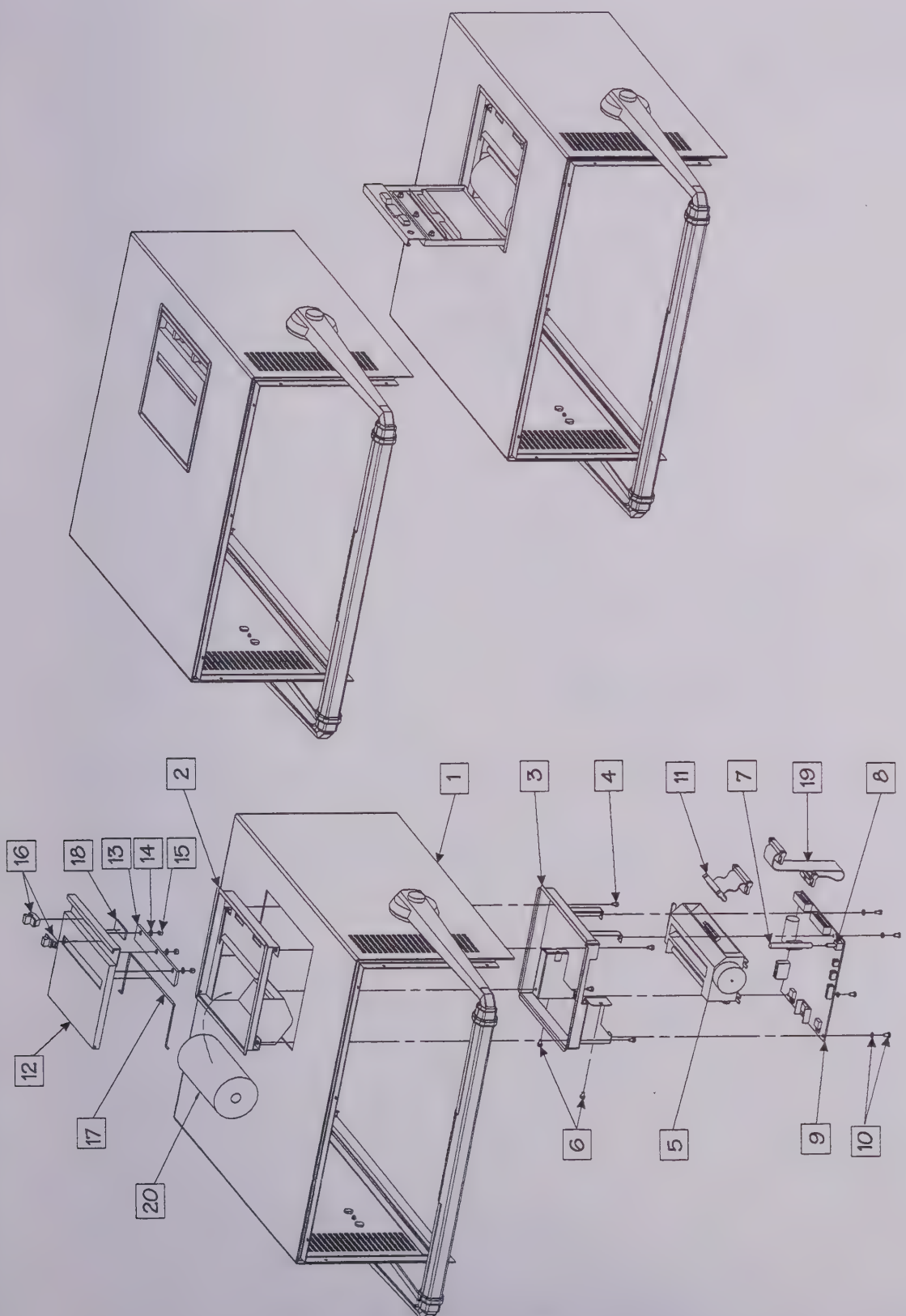


Figure 8-18 : LC574A Graphic Printer Assembly

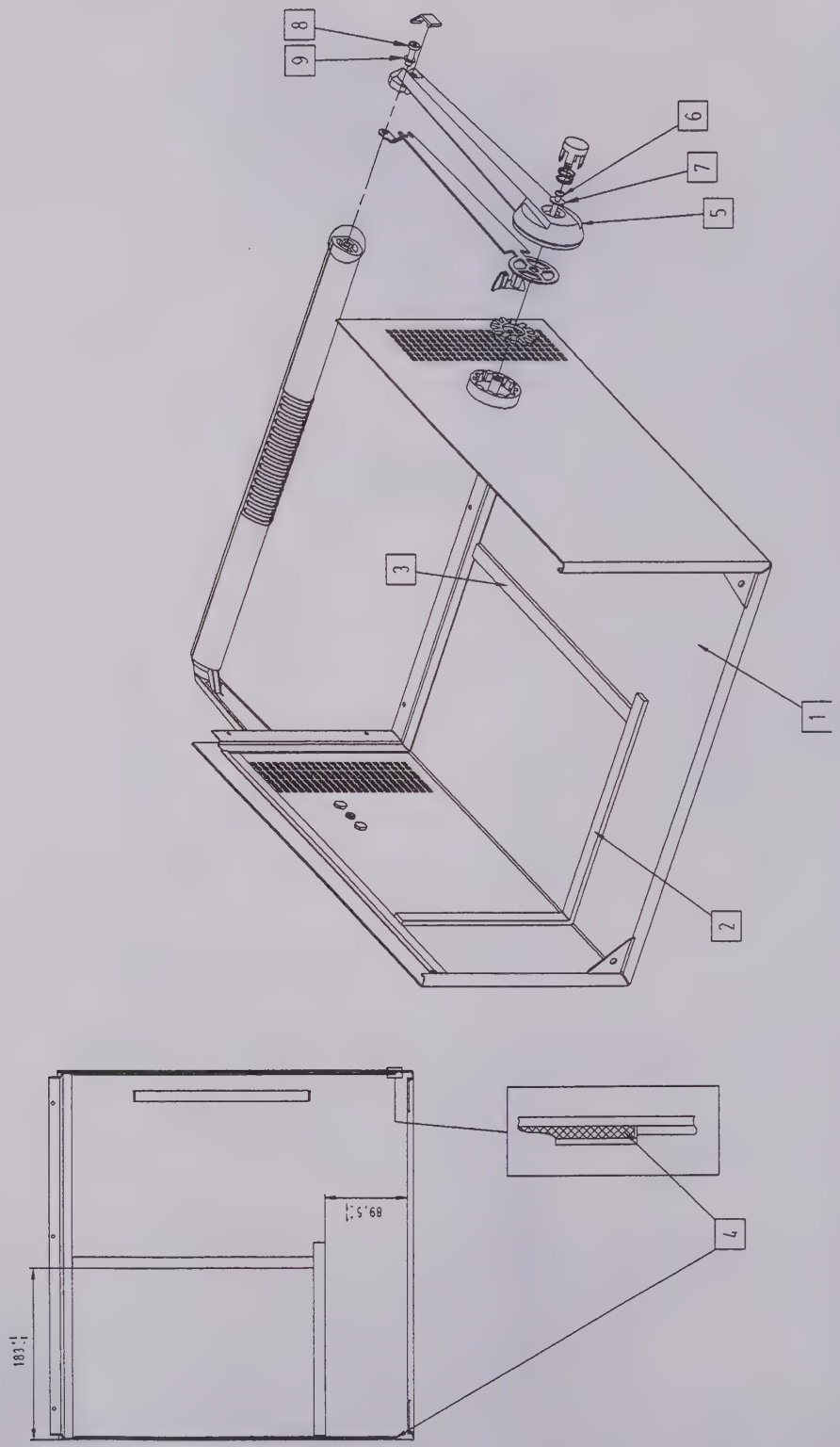


Figure 8-19 : LC574A Upper Cover Assembly

LC574A Graphic Printer Replaceable Parts (Figure 8-18)

Item	LeCroy Part Number	Qty	Description
1	709601010	1	GP01 Upper Cover Assembly
2	BOX-GP01	1	Graphic Printer Box
3	709601020	1	Graphic Printer Frame
4	550010105	4	Screw pan hd phil M3X5 w/Nylock
5	334000832	1	Thermal Printer
6	550010105	2	Screw pan hd phil M3X5 w/Nylock
7	709450523	1	Push Switch Extender
8	70GP01061	1	Printer Switch Button
9	F9300-7	1	Printer controller
10	550010106	4	Screw pan hd phil M3X6 w/Nylock
10	551430400	4	Washer Shockproof M3
11	780791604	1	Flat cable 2X13 (4cm)
12	Cover-GP01	1	Graphic Printer cover
13	70GP01051	1	Graphic Printer cutter
14	551430100	3	Flat Washer M3
15	552430300	3	Nut open end acorn M3
16	530040005	2	Slide Latch tab style
17	70GP01041	1	Graphic Printer cover axle
18	389340008	3	Auto adhesive rubber band 12X2 mm
19	780721022	1	Flat cable 2X10 (22 cm)
20	334000402	1	Thermal Paper for Seiko Printer

LC574A Upper Cover Replaceable Parts (Figure 8-19)

Item	LeCroy Part Number	Qty	Description
1	709600040	1	Upper Cover
2	380450012	1	NR adhesive tape 4X12 mm, length 370 mm
3	380450012	1	NR adhesive tape 4X12 mm, length 358 mm
4	350920024	2	Monel mesh strip diam 2.4 mm
5	709600090	1	Tip-up Carrying Handle
6	550440120	2	Screw pan hd phil M4X20 w/Nylock
7	709600090 kit	2	Flat Washer M4
8	709600090 kit	2	Socket head Screw M5X16 Loctite Coated
9	709600090 kit	2	Washer M5
10			

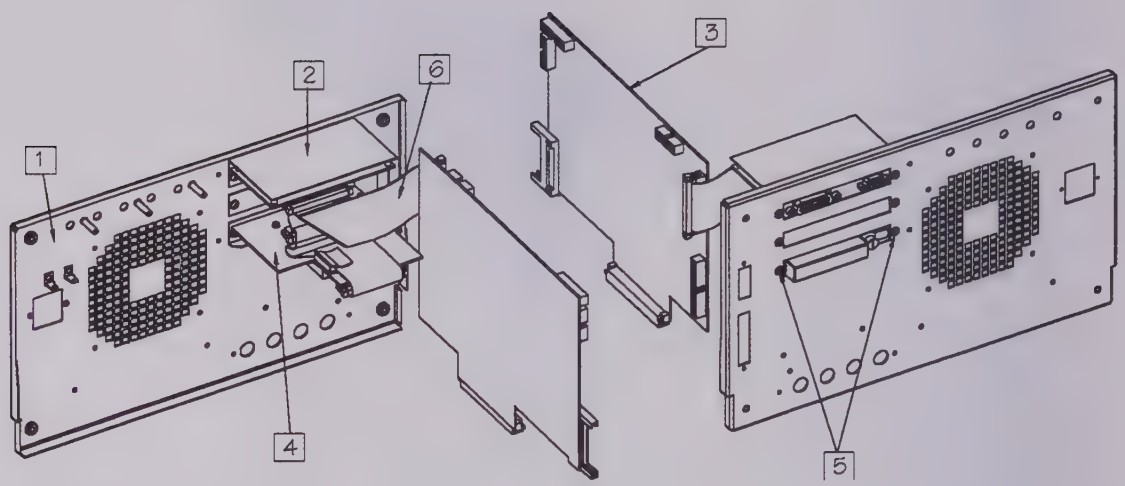


Figure 8-20 : LC574A Hard Disk Assembly

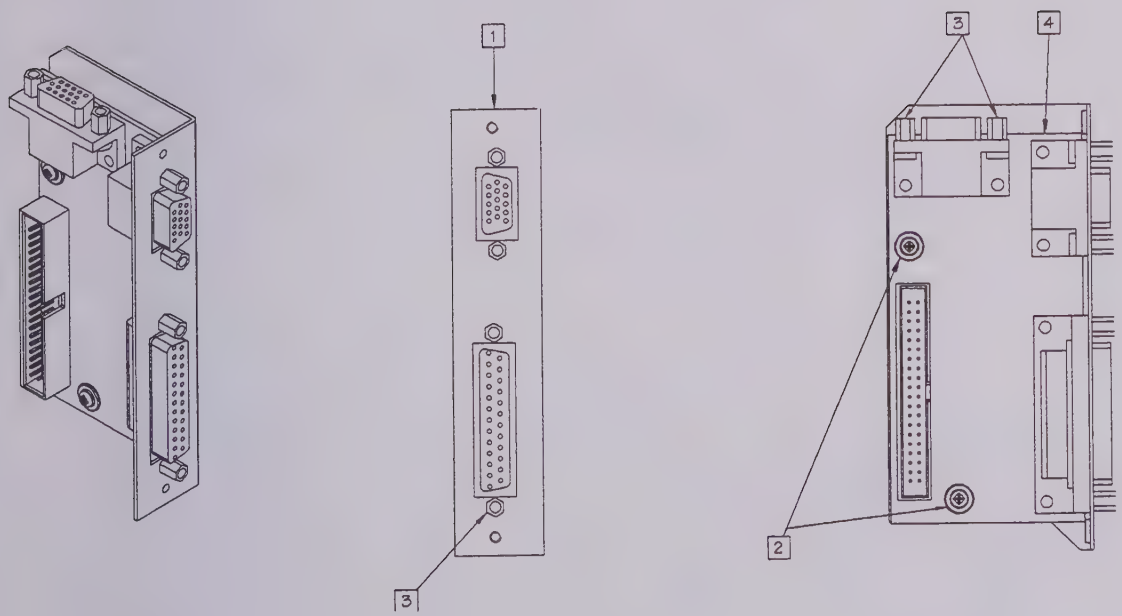


Figure 8-21 : LC574A Centronics & VGA Interface Assembly

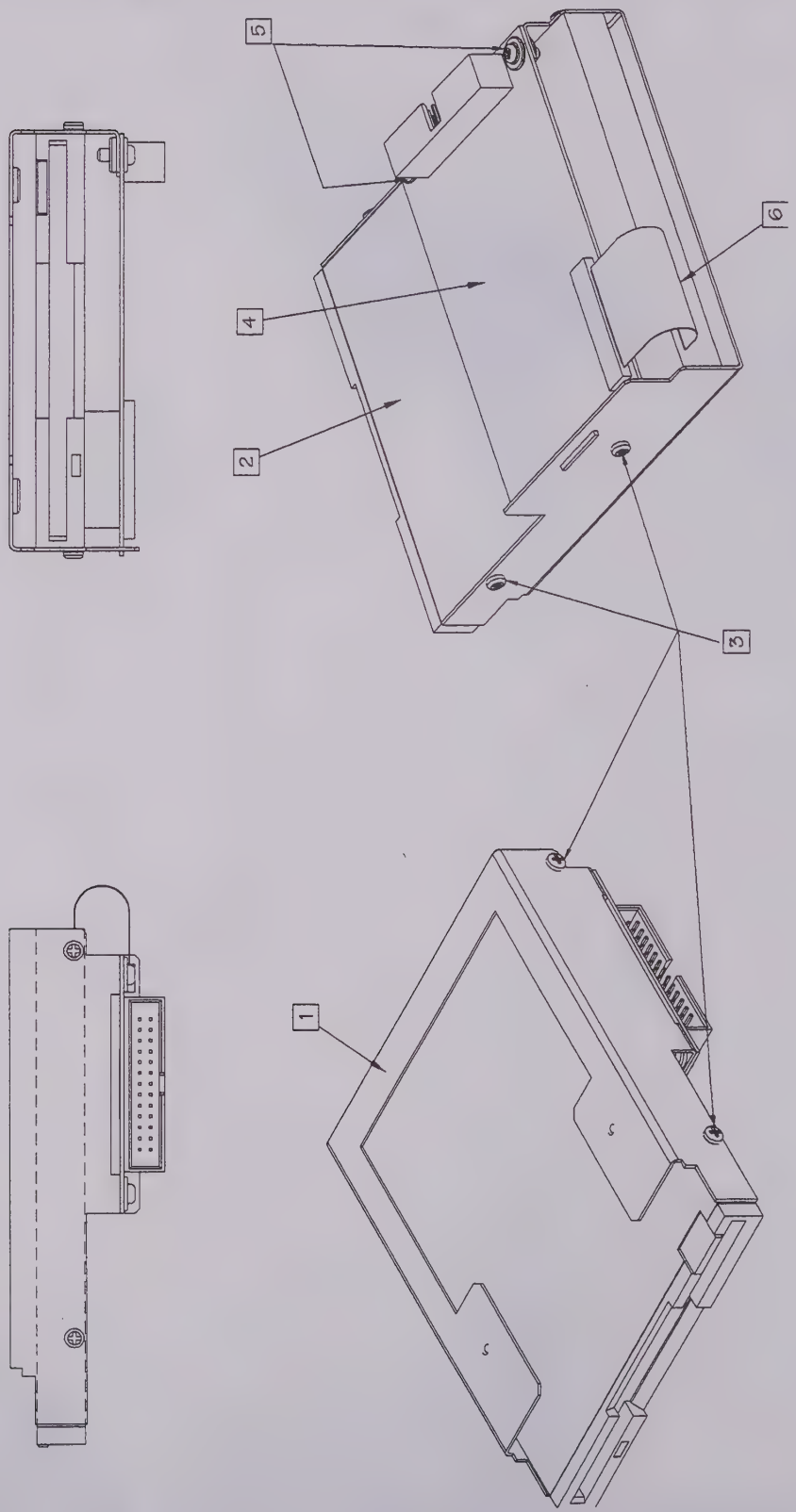


Figure 8-22 : LC574A Floppy Disk Assembly

LC574A Hard Disk Replaceable Parts (Figure 8-20)

Item	LeCroy Part Number	Qty	Description
1	RP9602-9	1	Rear Panel
2	F9300-4	1	GPIB & RS232 Interface
3	F9601-1-X	1	Processor Card
4	LCXXX-HD01	1	PCMCIA III Controller Assembly
5	550010706	2	Screw eco-fix M3X6 w/Nylock
6	780891032	1	Flat cable 2X20 (4 connect)

LC574A Centronics & VGA Replaceable Parts (Figure 8-21)

Item	LeCroy Part Number	Qty	Description
1	709601211	1	Bracket
2	550010706	2	Screw eco-fix M3X5 w/Nylock
3	405204000	6	Mounting hdw for conn.shell
4	F9601-2	1	Centronics & VGA Card

LC574A Floppy Replaceable Parts (Figure 8-22)

Item	LeCroy Part Number	Qty	Description
1	709600611	1	Floppy Drive support
2	330000002	1	Floppy Disk Drive 3.5"
3	550010103	4	Screw cyl hd phil M2.5X3 w/Nylock
4	S9601-6	1	Interface Card
5	550010706	2	Screw eco-fix M3X6 w/Nylock

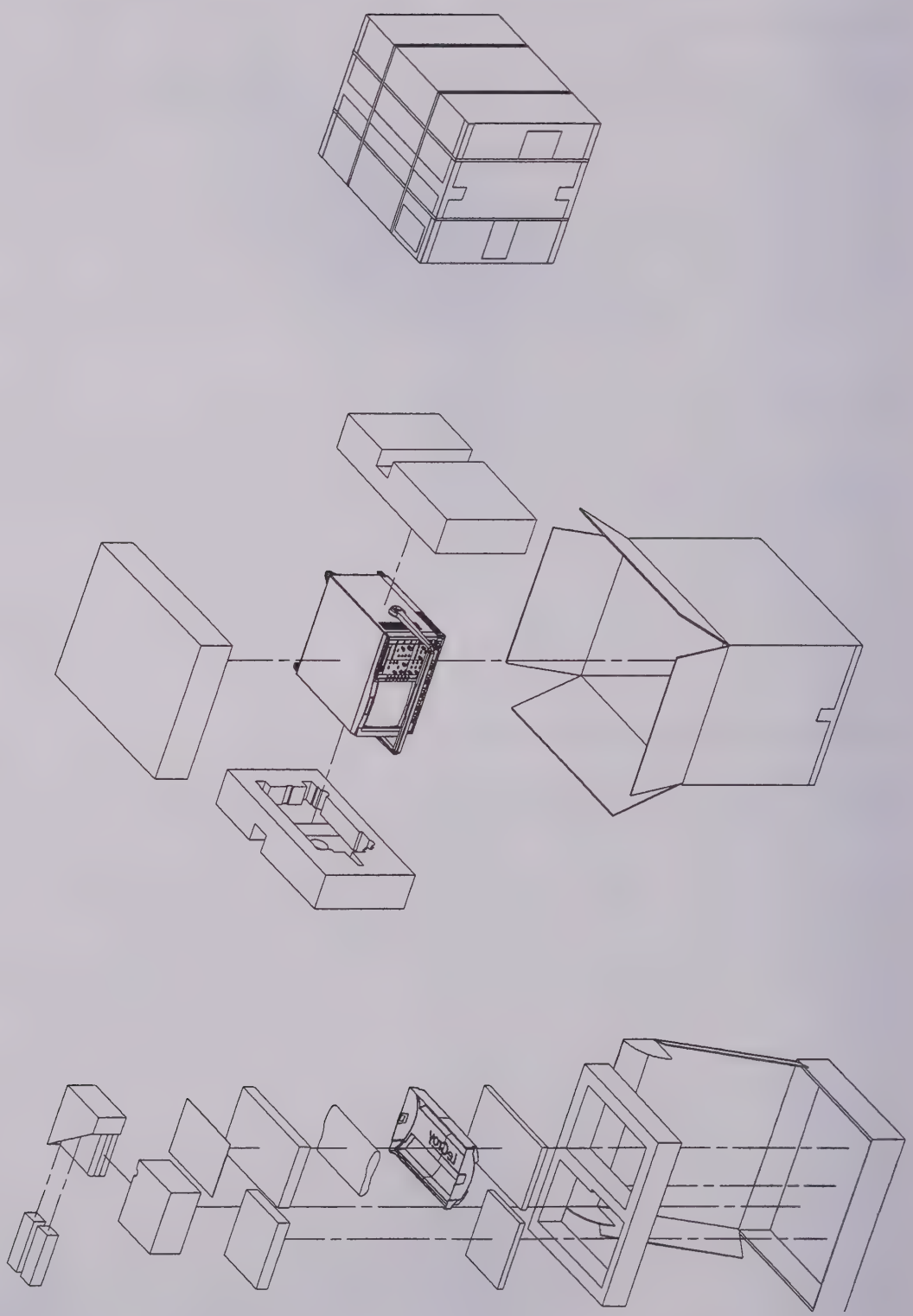


Figure 8-23 : LC574A Packaging Assembly

9. Schematics, Layouts, Parts List

This chapter contains the following schematics, layouts and parts list :

F9601-1-X Processor

9484M-2 Acquisition Memory

9384MEM-2 Acquisition Memory

F9601-2 Centronics and VGA Interface

F9384-31 Main Acquisition Card

F9300-4 GPIB & RS232 Interface

F9354-4 Time Base

F9602-5 Front Panel Keypad

F9604-5 Front Panel

F9601-6 Floppy Disk Interface

F9300-7 Printer Controller

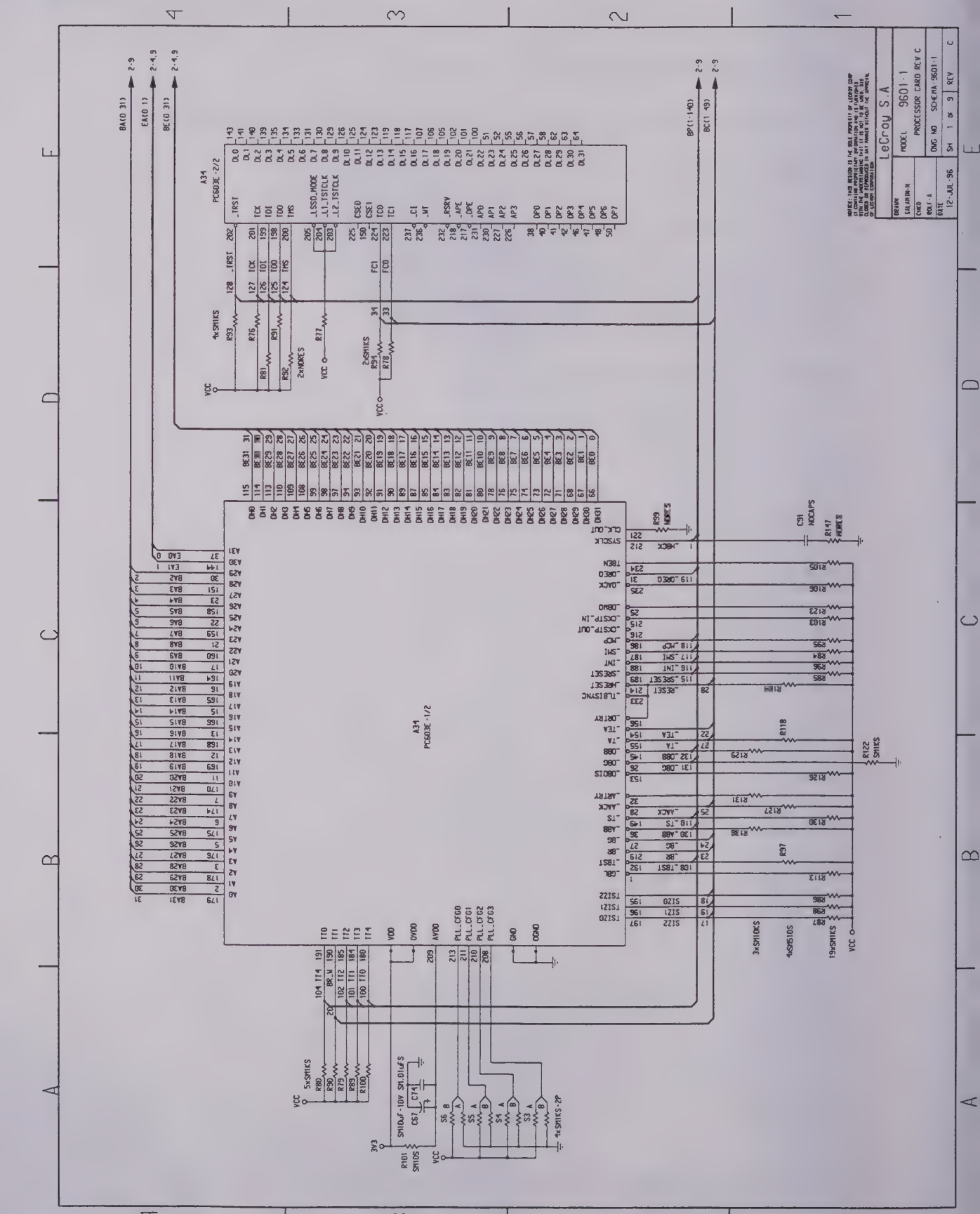
F9300-8 Hard Disk Interface

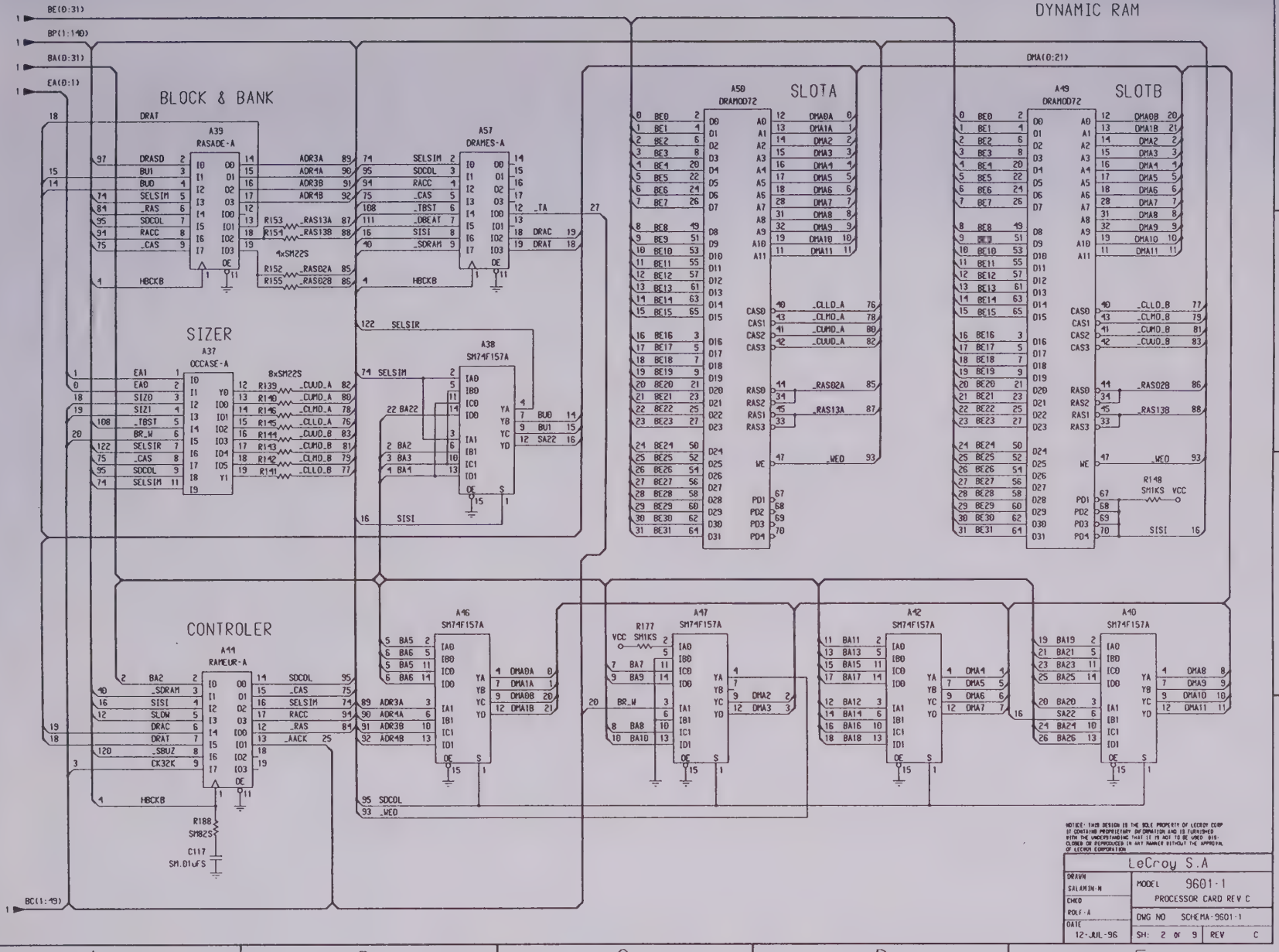
PS9651 Power Supply (PS1724) Diagram

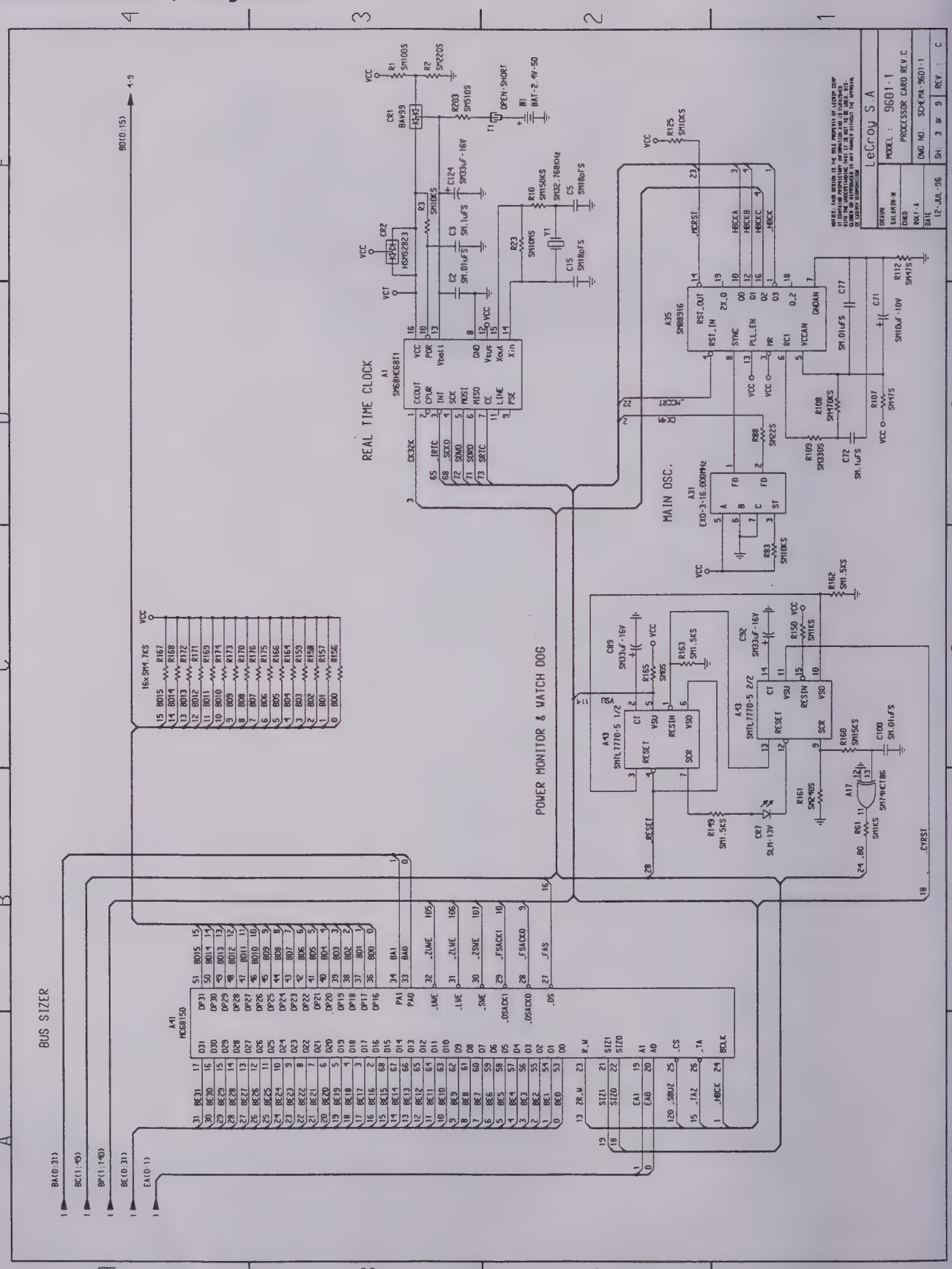
PSLC574-2 -2v Power Supply and Line Trigger Card

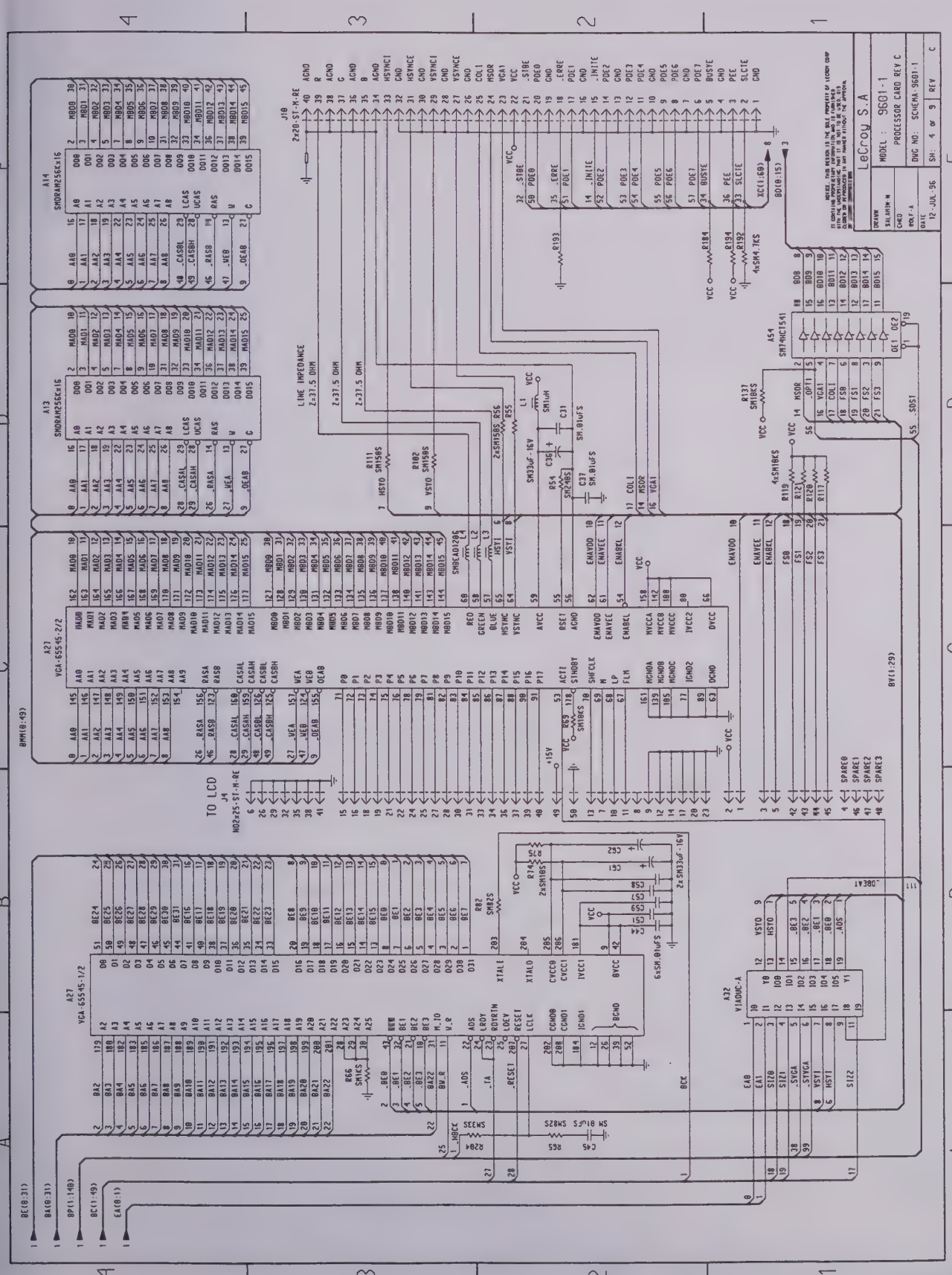
CD9610 Color Display

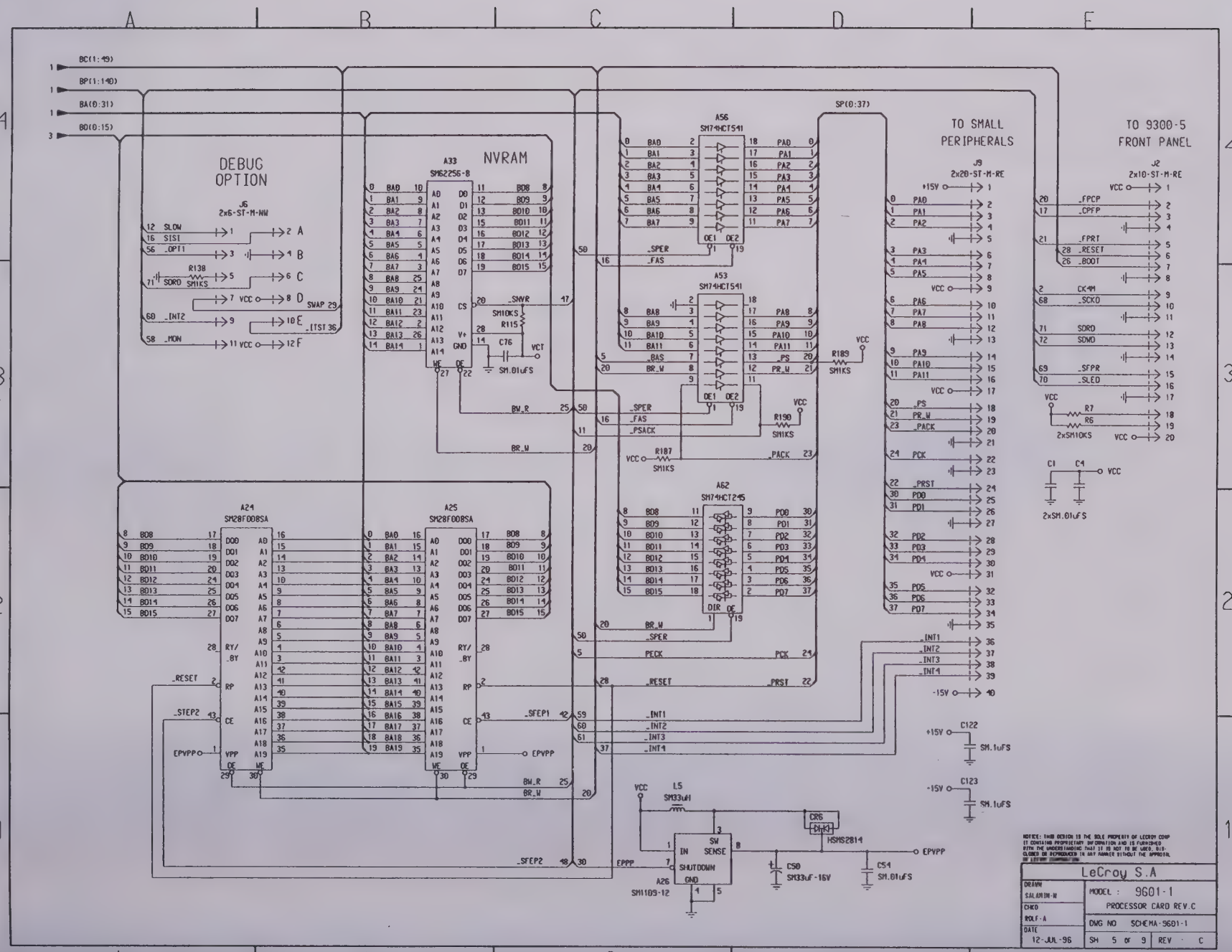
Schematics, Layouts

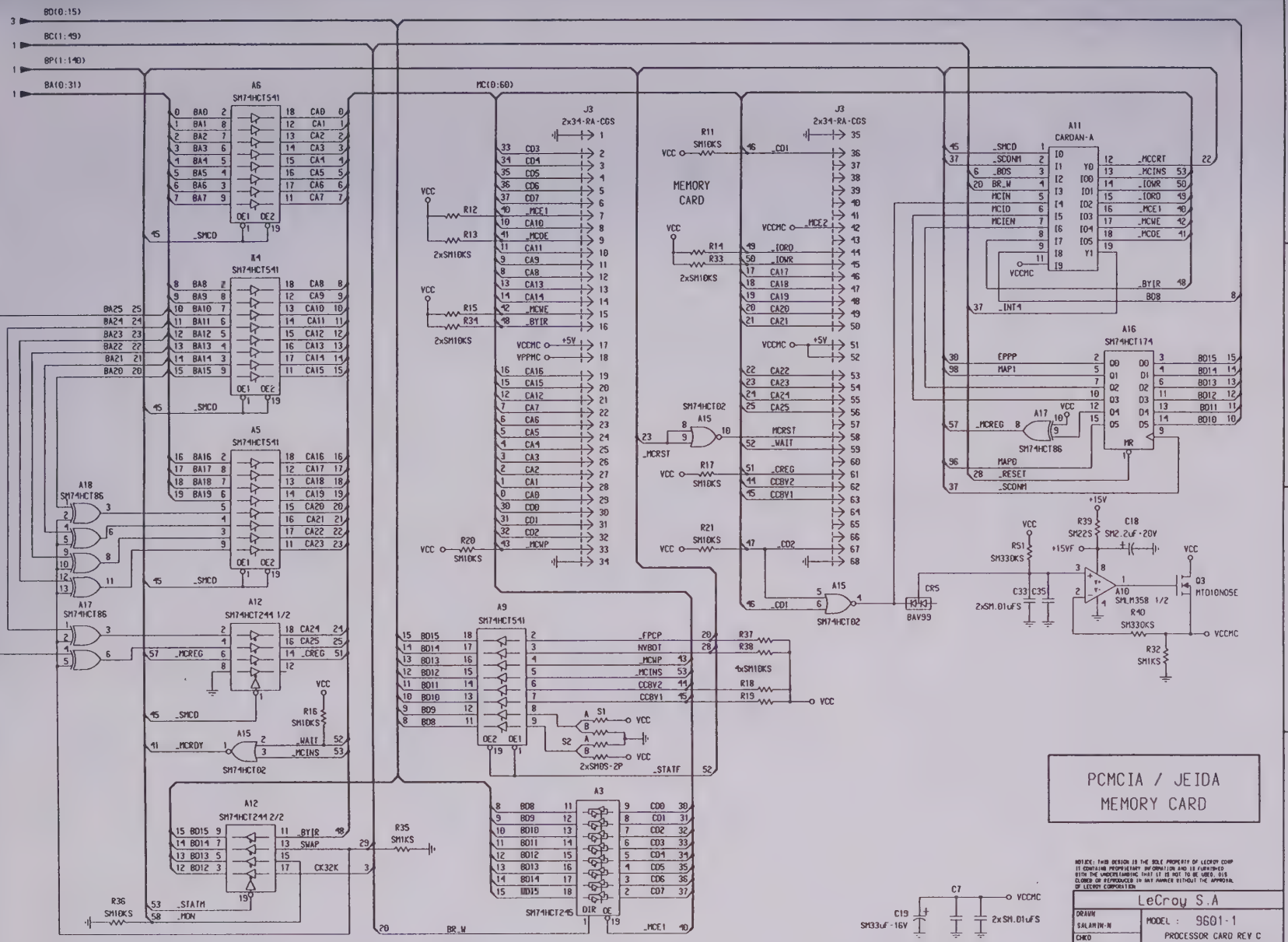


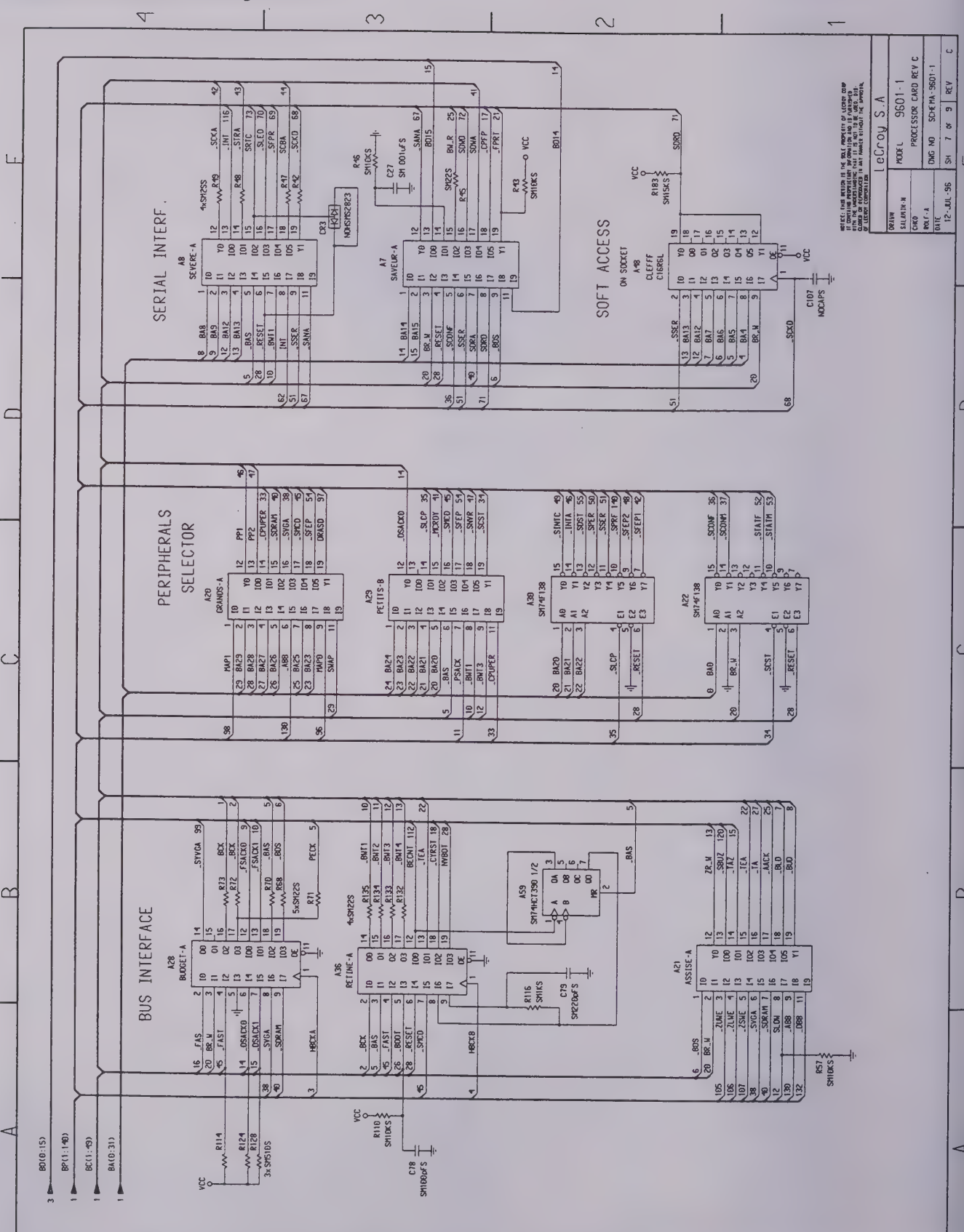

DYNAMIC RAM
BLOCK & BANK
SIZER
CONTROLER
SLOTA
SLOTB
A39 RASADE-A
A57 DRAMES-A
A37 OCCASE-A
A38 SM74F157A
A44 RAMEUR-A
A50 DRAMOD72
A49 DRAMOD72
A46 SM74F157A
A47 SM74F157A
A42 SM74F157A
A40 SM74F157A
BE(0:31)
BP(1:140)
BA(0:31)
EA(0:1)
BC(1:49)
DMA(0:21)
4xSM22S
8xSM22S
R188 SM82S
C117 SM.01uFS
R148 SM1KS VCC
R177 VCC SM1KS
LeCroy S.A
MODEL 9601-1
PROCESSOR CARD REV C
DWG NO SCHEMA-9601-1
SH: 2 OF 9 REV C
DRAWN SALAMIN-M
CHKD ROLF-A
DATE 12-JUL-96

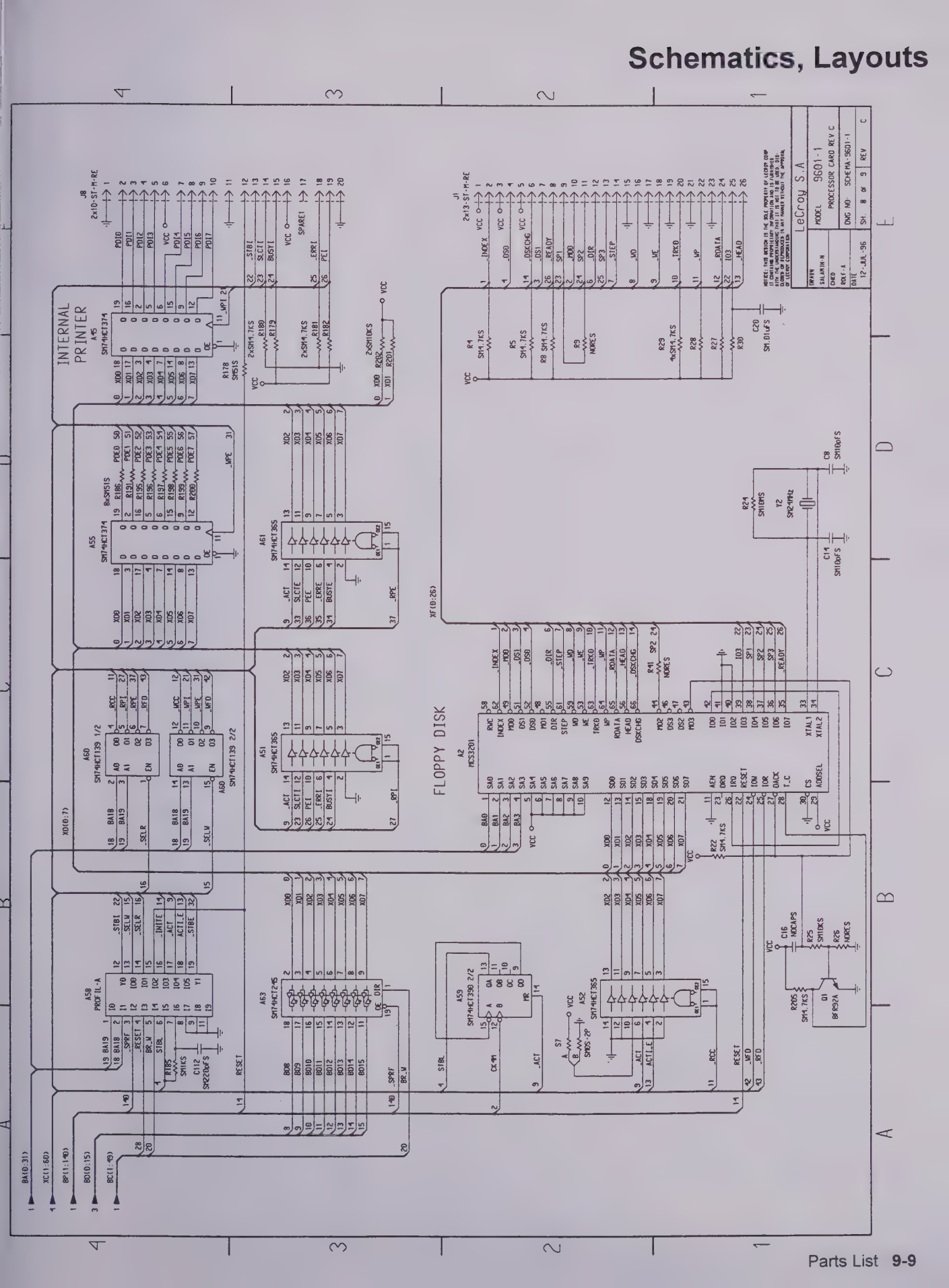

REAL TIME CLOCK
MAIN OSC.
POWER MONITOR & WATCH DOG
BUS SIZER
LeCroy S.A
MODEL : 9601-1
PROCESSOR CARD REV C
DWG NO. SCHEMA-9601-1
SH. 3 OF 9
REV. C
DATE 12-JUL-96

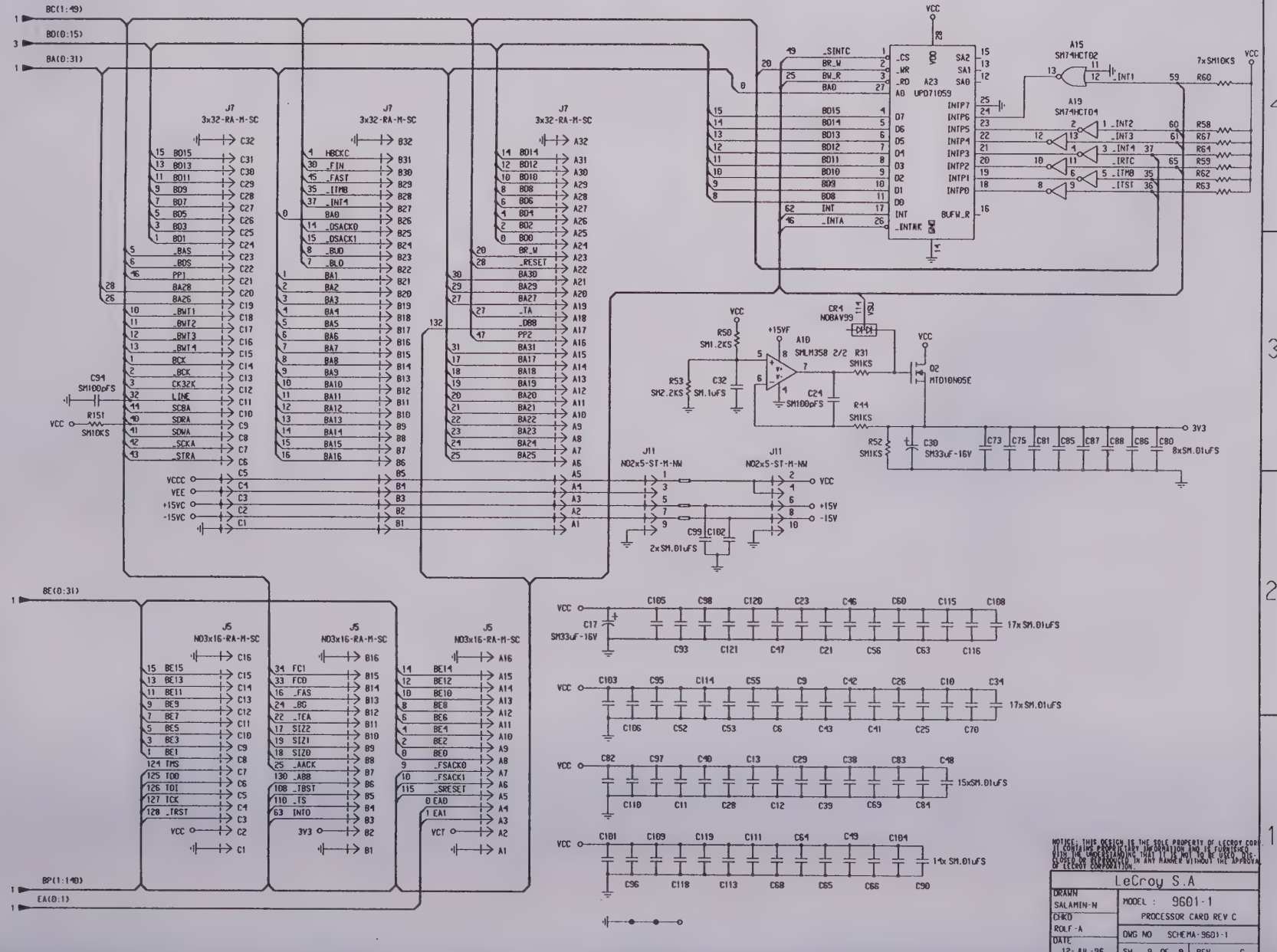

LeCroy S.A
MODEL : 9601-1
PROCESSOR CARD REV C
DWG NO: SCHEMA-9601-1
SH: 4 OF 9
REV C
DATE 12-JUL-96
A14 SMDRAM256Kx16
A13 SMDRAM256Kx16
A27 VGA-65545-2/2
A27 VGA-65545-1/2
A32 V1ADUC-A
A54 SM74HCT541
J10 2x20-ST-M-RE
J4 NO2x25-ST-M-RE
TO LCD
LINE IMPEDANCE
Z=37.5 OHM
Z=37.5 OHM
Z=37.5 OHM


DEBUG OPTION
NVRAM
TO SMALL PERIPHERALS
TO 9300-5 FRONT PANEL
A33 SM62256-B
A56 SM74HCT541
A53 SM74HCT541
A62 SM74HCT245
A24 SM28F008SA
A25 SM28F008SA
A26 SM1105-12
J6 2x6-ST-M-NW
J9 2x20-ST-M-RE
J2 2x10-ST-M-RE
BC(1:49)
BP(1:140)
BA(0:31)
BD(0:15)
SP(0:37)
LeCroy S.A
MODEL : 9601-1
PROCESSOR CARD REV.C
DWG NO SCHEMA-9601-1
SH 5 OF 9
REV C
DRAWN SALAMIN-M
CHKD ROLF-A
DATE 12-JUL-96


PCMCIA / JEIDA
MEMORY CARD
MEMORY
CARD
LeCroy S.A
MODEL : 9601-1
PROCESSOR CARD REV C
DWG NO: SCHEMA-9601-1
SH: 6 or 9
REV C
DRAWN SALAMIN-M
CHKD ROLF-A
DATE 12-JUL-96


SERIAL INTERF.
PERIPHERALS SELECTOR
SOFT ACCESS
BUS INTERFACE
LeCroy S.A
MODEL 9601-1
PROCESSOR CARD REV C
DWG NO SCHEMA-9601-1
SH 7 OF 9 REV C
12-JUL-96


INTERNAL PRINTER
FLOPPY DISK
LeCroy S.A
MODEL 9601-1
PROCESSOR CARD REV C
DWG NO: SCHEMA-9601-1
SH: 8 OF 9
REV C
DRAWN
CHKED
APP'D
DATE 12-JUL-96


BC(1:49)
BD(0:15)
BA(0:31)
BE(0:31)
BP(1:140)
EA(0:1)
J7
3x32-RA-M-SC
J5
NO3x16-RA-M-SC
J11
NO2x5-ST-M-NW
A15
SM74HCT02
A19
SM74HCT04
A10
SMLM358 2/2
Q2
MTD10N05E
CR1
NOBAV99
U1
UPD71059
_SINTC
BR_W
_RD
_WR
_CS
BW_R
BAD
_INT1
_INT2
_INT3
_INT4
_ITMB
_IRTC
_ITST
_INTA
_INTAK
BUFW_R
7xSM10KS
R60
R58
R57
R61
R64
R59
R62
R63
R50
SM1.2KS
R53
SM2.2KS
C32
SM.1uFS
C24
SM100pFS
R31
SM1KS
R44
SM1KS
R52
SM1KS
C30
SM33uF-16V
C73
C75
C81
C85
C87
C88
C86
C80
8xSM.01uFS
3V3
C94
SM100pFS
R151
SM10KS
C99
C102
2xSM.01uFS
VCC
VEE
+15VC
-15VC
+15VF
-15V
C17
SM33uF-16V
17xSM.01uFS
15xSM.01uFS
14x SM.01uFS
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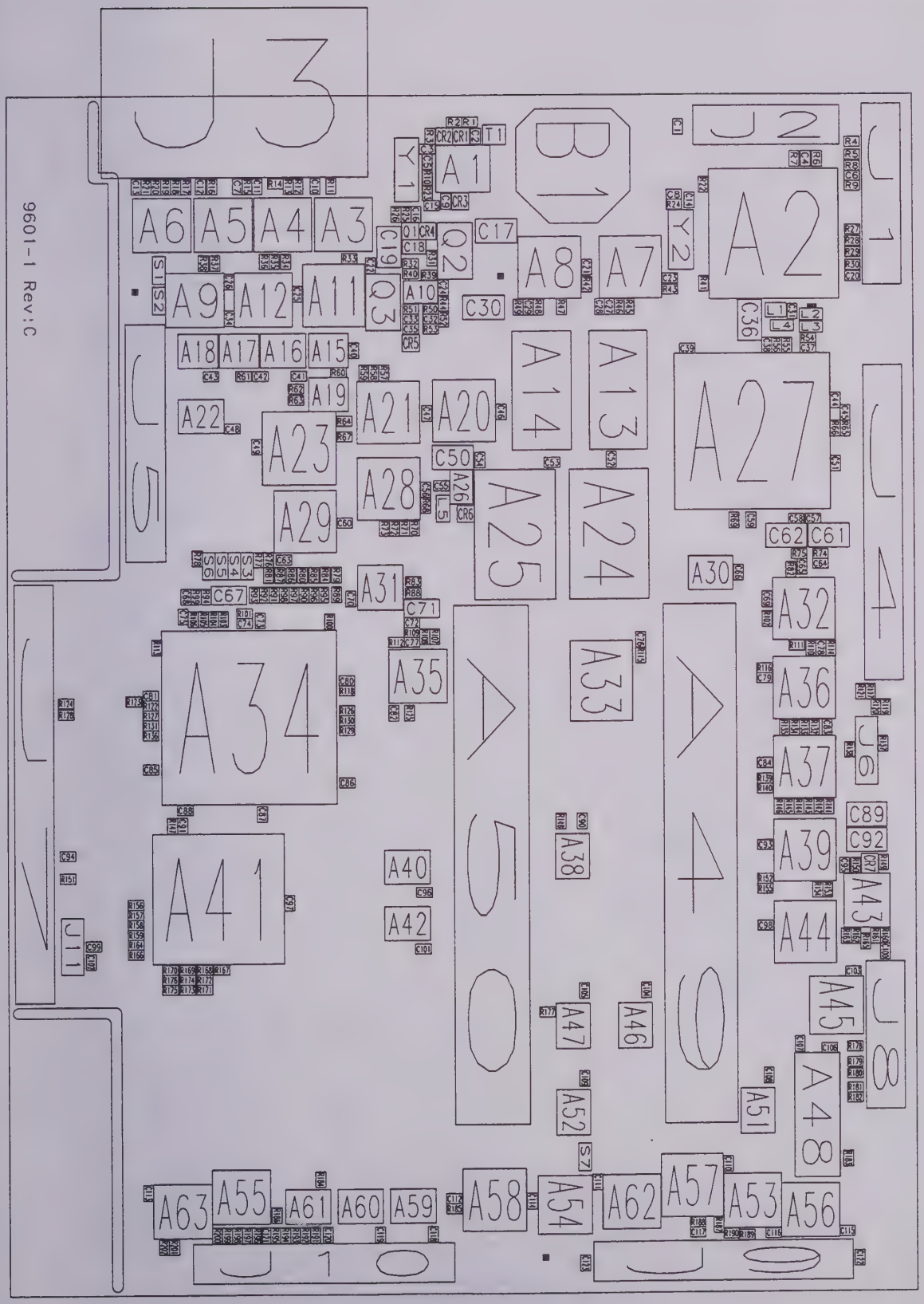
LeCroy S.A
DRAWN
SALAMIN-N
CHKD
ROLF-A
DATE
12-JUL-96
MODEL : 9601-1
PROCESSOR CARD REV C
DWG NO SCHEMA-9601-1
SH. 9 OF 9
REV C


9601-1 Rev:C
J3
B1
J2
J1
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
A11
A12
A13
A14
A15
A16
A17
A18
A19
A20
A21
A22
A23
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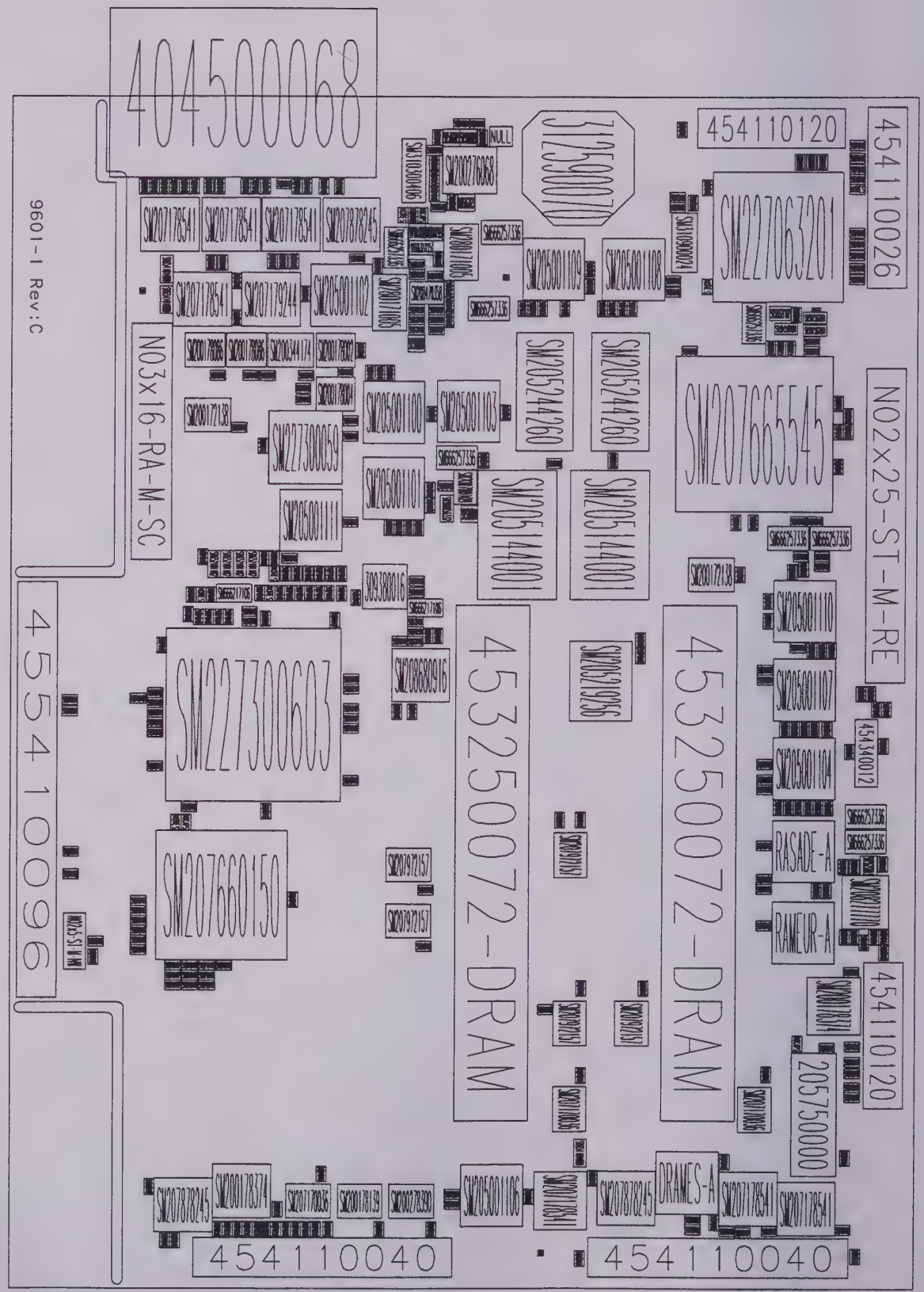
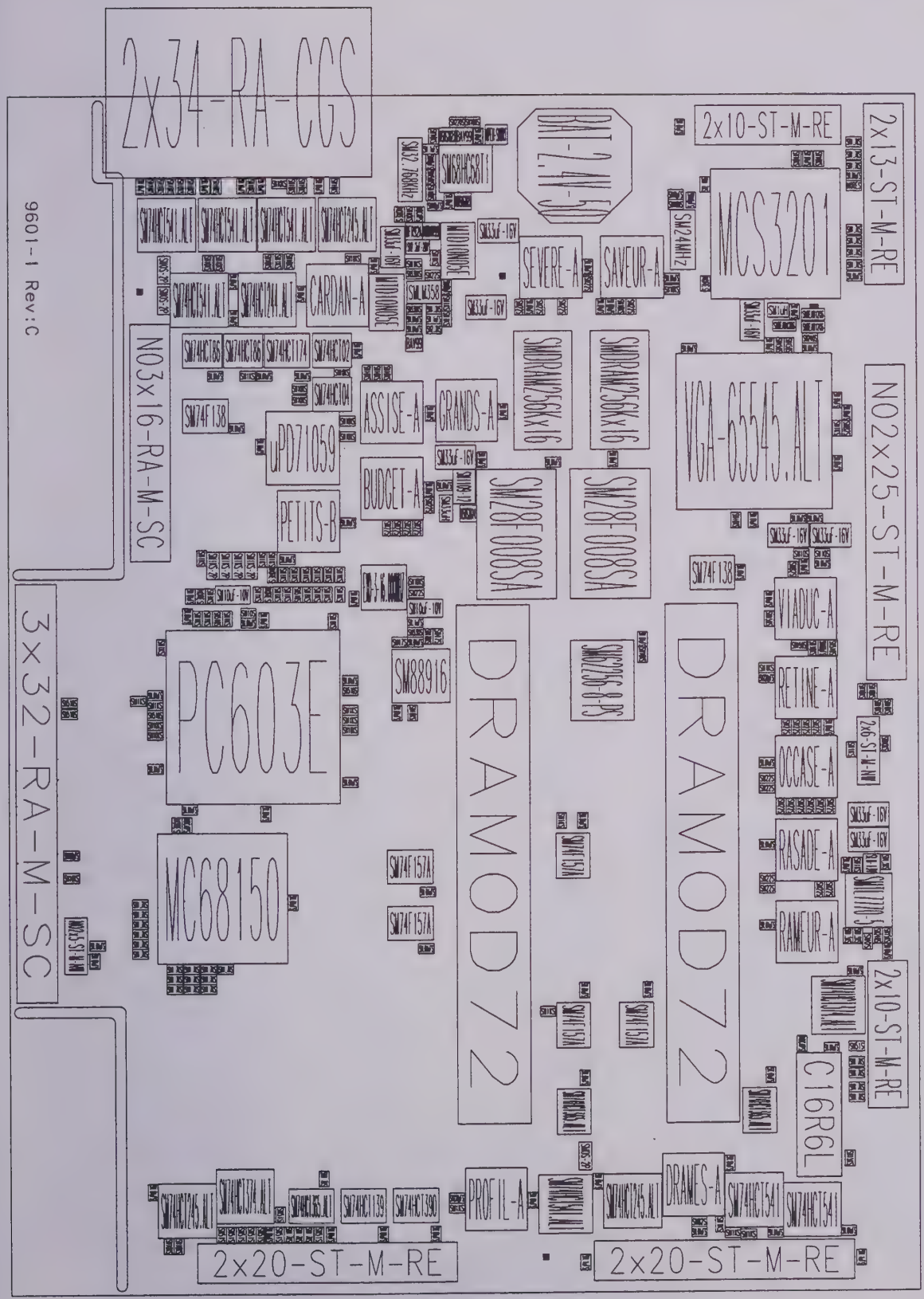
A56
A57
A58
A59
A60
A61
A62
A63
J4
J5
J6
J8
J9
J10
J11
Y1
Y2
Q1
Q2
Q3
T1
C17
C18
C19
C30
C36
C50
C61
C62
C67
C71
C89
C92
L1
L2
L3
L4
L5
S1
S2
S3
S4
S5
S6
S7

Schematics, Layouts




2x34-RA-CGS
9601-1 Rev:C
BAT-2.4V-5D
2x10-ST-M-RE
2x13-ST-M-RE
MCS3201
NO2x25-ST-M-RE
VGA-65545.ALT
NO3x16-RA-M-SC
3x32-RA-M-SC
PC603E
MC68150
DRAMOD72
DRAMOD72
2x20-ST-M-RE
2x20-ST-M-RE
2x10-ST-M-RE
C16R6L
SEVERE-A
SAVEUR-A
CARDAN-A
ASSISE-A
GRANDS-A
BUDGET-A
PETITS-B
UPD71059
VIADUC-A
RETINE-A
OCCASE-A
RASADE-A
RAMEUR-A
DRAMES-A
PROFIL-A
SM88916
SM28F008SA
SM28F008SA
SMDRAM256Kx16
SMDRAM256Kx16

PART: F9601-1-X DESC : PROCESSOR with 8Mb or 64Mb RAM

Location	Part Number	Description	Location	Part Number	Description
A1	SM200276068	SM68HC68T1	A43	SM208277770	SMTL7770-5
A2	SM227063201	MCS3201	A44	SM205001113	RAMEUR-A
A3	SM207878245	SM74HCT245	A45	SM200178374	SM74HCT374
A4	SM207178541	SM74HCT541	A46	SM207972157	SM74F157A
A5	SM207178541	SM74HCT541	A47	SM207972157	SM74F157A
A6	SM207178541	SM74HCT541	A48	205750000	C16R6L
A7	SM205001108	SAVEUR-A	A49	453250072	DRAMOD72
A8	SM205001109	SEVERE-A	A50	453250072	DRAMOD72
A9	SM207178541	SM74HCT541	A51	SM207170036	SM74HCT365
A10	SM208470358	SMLM358	A52	SM207170036	SM74HCT365
A11	SM205001102	CARDAN-A	A53	SM207178541	SM74HCT541
A12	SM207179244	SM74HCT244	A54	SM207178541	SM74HCT541
A13	SM205244260	DRAM256Kx16	A55	SM200178374	SM74HCT374
A14	SM205244260	DRAM256Kx16	A56	SM207178541	SM74HCT541
A15	SM200178002	SM74HCT02	A57	SM205001115	DRAMES-A
A16	SM200344174	SM74HCT174	A58	SM205001106	PROFIL-A
A17	SM200178086	SM74HCT86	A59	SM200278390	SM74HCT390
A18	SM200178086	SM74HCT86	A60	SM200178139	SM74HCT139
A19	SM200178004	SM74HCT04	A61	SM207170036	SM74HCT365
A20	SM205001103	GRANDS-A	A62	SM207878245	SM74HCT245
A21	SM205001100	ASSISE-A	A63	SM207878245	SM74HCT245
A22	SM200172138	SM74F138	B1	312590070	BAT-2.4V-50
A23	SM227300059	uPD71059	C1	SM661207103	SM.01uFS
A24	SM205144001	SM28F008SA	C2	SM661207103	SM.01uFS
A25	SM205144001	SM28F008SA	C3	SM661207104	SM.1uFS
A26	SM208780109	SM1109-12	C4	SM661207103	SM.01uFS
A27	SM207665545	VGA-65545	C5	SM661255180	SM18pFS
A28	SM205001116	BUDGET-C	C6	SM661207103	SM.01uFS
A29	SM205001111	PETITS-B	C7	SM661207103	SM.01uFS
A30	SM200172138	SM74F138	C8	SM661255100	SM10pFS
A31	309380016	3-16.000MHZ	C9	SM661207103	SM.01uFS
A32	SM205001110	VIADUC-A	C10	SM661207103	SM.01uFS
A33	SM205219257	SM62256-8-HD	C11	SM661207103	SM.01uFS
A34	SM227300603	PC603E	C12	SM661207103	SM.01uFS
A35	SM208680916	SM88916	C13	SM661207103	SM.01uFS
A36	SM205001107	RETINE-A	C14	SM661255100	SM10pFS
A37	SM205001104	OCCASE-A	C15	SM661255180	SM18pFS
A38	SM207972157	SM74F157A	C17	SM666257336	SM33uF-16V
A39	SM205001114	RASADE-A	C18	SM666327225	SM2.2uF-20V
A40	SM207972157	SM74F157A	C19	SM666257336	SM33uF-16V
A41	SM207660150	MC68150	C20	SM661207103	SM.01Ufs
A42	SM207972157	SM74F157A	C21	SM661207103	SM.01uFS

PART: F9601-1-X DESC : PROCESSOR with 8Mb or 64Mb RAM

Location	Part Number	Description	Location	Part Number	Description
C22	SM661207103	SM.01uFS	C65	SM661207103	SM.01uFS
C23	SM661207103	SM.01uFS	C66	SM661207103	SM.01uFS
C24	SM661255101	SM100pFS	C67	SM666217106	SM10uF-10V
C25	SM661207103	SM.01uFS	C68	SM661207103	SM.01uFS
C26	SM661207103	SM.01uFS	C69	SM661207103	SM:01uFS
C27	SM661207102	SM.001uFS	C70	SM661207103	SM.01uFS
C28	SM661207103	SM.01uFS	C71	SM666217106	SM10uF-10V
C29	SM661207103	SM.01uFS	C72	SM661207104	SM.1uFS
C30	SM666257336	SM33uF-16V	C73	SM661207103	SM.01uFS
C31	SM661207103	SM.01uFS	C74	SM661207103	SM.01uFS
C32	SM661207104	SM.1uFS	C75	SM661207103	SM.01uFS
C33	SM661207103	SM.01uFS	C76	SM661207103	SM.01uFS
C34	SM661207103	SM.01uFS	C77	SM661207103	SM.01uFS
C35	SM661207103	SM.01uFS	C78	SM661255101	SM100pFS
C36	SM666257336	SM33uF-16V	C79	SM661255221	SM220pFS
C37	SM661207103	SM.01uFS	C80	SM661207103	SM.01uFS
C38	SM661207103	SM.01uFS	C81	SM661207103	SM.01uFS
C39	SM661207103	SM.01uFS	C82	SM661207103	SM.01uFS
C40	SM661207103	SM.01uFS	C83	SM661207103	SM.01uFS
C41	SM661207103	SM.01uFS	C84	SM661207103	SM.01uFS
C42	SM661207103	SM.01uFS	C85	SM661207103	SM.01uFS
C43	SM661207103	SM.01uFS	C86	SM661207103	SM.01uFS
C44	SM661207103	SM.01uFS	C87	SM661207103	SM.01uFS
C46	SM661207103	SM.01uFS	C88	SM661207103	SM.01uFS
C47	SM661207103	SM.01uFS	C89	SM666257336	SM33uF-16V
C48	SM661207103	SM.01uFS	C90	SM661207103	SM.01uFS
C49	SM661207103	SM.01uFS	C92	SM666257336	SM33uF-16V
C50	SM666257336	SM33uF-16V	C93	SM661207103	SM.01uFS
C51	SM661207103	SM.01uFS	C94	SM661255101	SM100pFS
C52	SM661207103	SM.01uFS	C95	SM661207103	SM.01uFS
C53	SM661207103	SM.01uFS	C96	SM661207103	SM.01uFS
C54	SM661207103	SM.01uFS	C97	SM661207103	SM.01uFS
C55	SM661207103	SM.01uFS	C98	SM661207103	SM.01uFS
C56	SM661207103	SM.01uFS	C99	SM661207103	SM.01uFS
C57	SM661207103	SM.01uFS	C100	SM661207103	SM.01uFS
C58	SM661207103	SM.01uFS	C101	SM661207103	SM.01uFS
C59	SM661207103	SM.01uFS	C102	SM661207103	SM.01uFS
C60	SM661207103	SM.01uFS	C103	SM661207103	SM.01uFS
C61	SM666257336	SM33uF-16V	C104	SM661207103	SM.01uFS
C62	SM666257336	SM33uF-16V	C105	SM661207103	SM.01uFS
C63	SM661207103	SM.01uFS	C106	SM661207103	SM.01uFS
C64	SM661207103	SM.01uFS	C108	SM661207103	SM.01uFS

PART: F9601-1-X DESC : PROCESSOR with 8Mb or 64Mb RAM

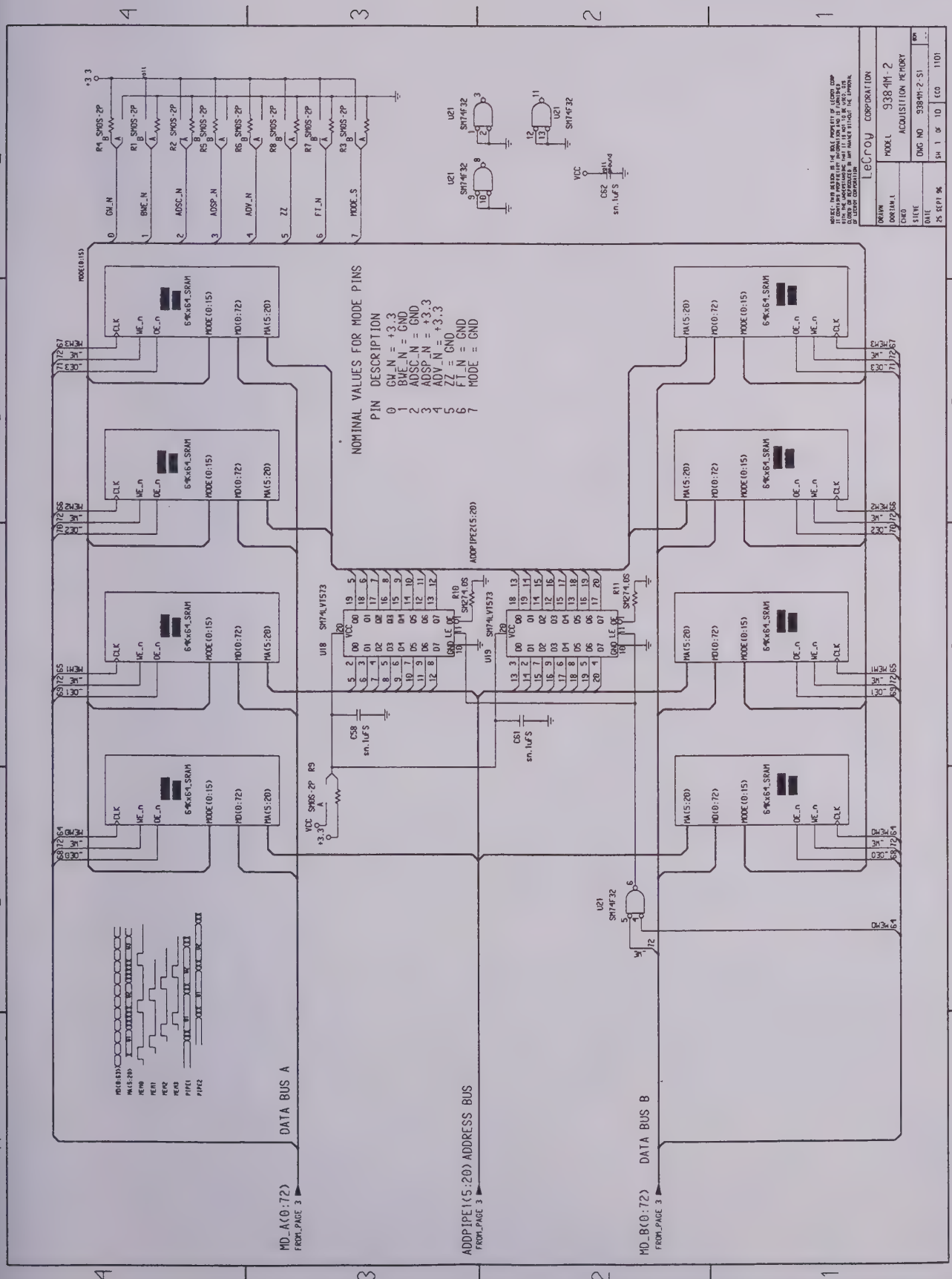
Location	Part Number	Description	Location	Part Number	Description
C109	SM661207103	SM.01uFS	R4	SM652101472	SM4.7KS
C110	SM661207103	SM.01uFS	R5	SM652101472	SM4.7KS
C111	SM661207103	SM.01uFS	R6	SM652101103	SM10KS
C112	SM661255221	SM220pFS	R7	SM652101103	SM10KS
C113	SM661207103	SM.01uFS	R8	SM652101472	SM4.7KS
C114	SM661207103	SM.01uFS	R10	SM652101154	SM150KS
C115	SM661207103	SM.01uFS	R11	SM652101103	SM10KS
C116	SM661207103	SM.01uFS	R12	SM652101103	SM10KS
C117	SM661207103	SM.01uFS	R13	SM652101103	SM10KS
C118	SM661207103	SM.01uFS	R14	SM652101103	SM10KS
C119	SM661207103	SM.01uFS	R15	SM652101103	SM10KS
C120	SM661207103	SM.01uFS	R16	SM652101103	SM10KS
C121	SM661207103	SM.01uFS	R17	SM652101103	SM10KS
C122	SM661207104	SM.1uFS	R18	SM652101103	SM10KS
C123	SM661207104	SM.1uFS	R19	SM652101103	SM10KS
C124	SM666257336	SM33uF-16V	R20	SM652101103	SM10KS
C125	SM661207104	SM.1uFS	R21	SM652101103	SM10KS
C126	SM661207104	SM.1uFS	R22	SM652101472	SM4.7KS
CR1	SM236030099	BAV99	R23	SM652101106	SM10MS
CR2	SM253032823	HSMS2823	R24	SM652101106	SM10MS
CR5	SM236030099	BAV99	R25	SM652101103	SM10KS
CR6	SM232032814	HSMS2814	R27	SM652101472	SM4.7KS
CR7	SM256232013	SLM-13V	R28	SM652101472	SM4.7KS
J1	454110026	2x13-ST-M-RE	R29	SM652101472	SM4.7KS
J2	454110120	2x10-ST-M-RE	R30	SM652101472	SM4.7KS
J3	404500068	2x34-RA-CGS	R31	SM652101102	SM1KS
J6	454340012	2x6-ST-M-NW	R32	SM652101102	SM1KS
J7	455410096	3x32-RA-M-SC	R33	SM652101103	SM10KS
J8	454110120	2x10-ST-M-RE	R34	SM652101103	SM10KS
J9	454110040	2x20-ST-M-RE	R35	SM652101102	SM1KS
J10	454110040	2x20-ST-M-RE	R36	SM652101103	SM10KS
L1	SM300327102	SM1uH	R37	SM652101103	SM10KS
L2	SM301502001	SMBEAD1206	R38	SM652101103	SM10KS
L3	SM301502001	SMBEAD1206	R39	SM652101220	SM22S
L4	SM301502001	SMBEAD1206	R40	SM652101334	SM330KS
L5	SM300056332	SM33uH	R42	SM652101220	SM22S
Q1	SM270130092	BFR92A	R43	SM652101103	SM10KS
Q2	SM280171005	MTD10N05E	R44	SM652101102	SM1KS
Q3	SM280171005	MTD10N05E	R45	SM652101220	SM22S
R1	SM652101101	SM100S	R46	SM652101103	SM10KS
R2	SM652101221	SM220S	R47	SM652101220	SM22S
R3	SM652101103	SM10KS	R48	SM652101220	SM22S

PART: F9601-1-X DESC : PROCESSOR with 8Mb or 64Mb RAM

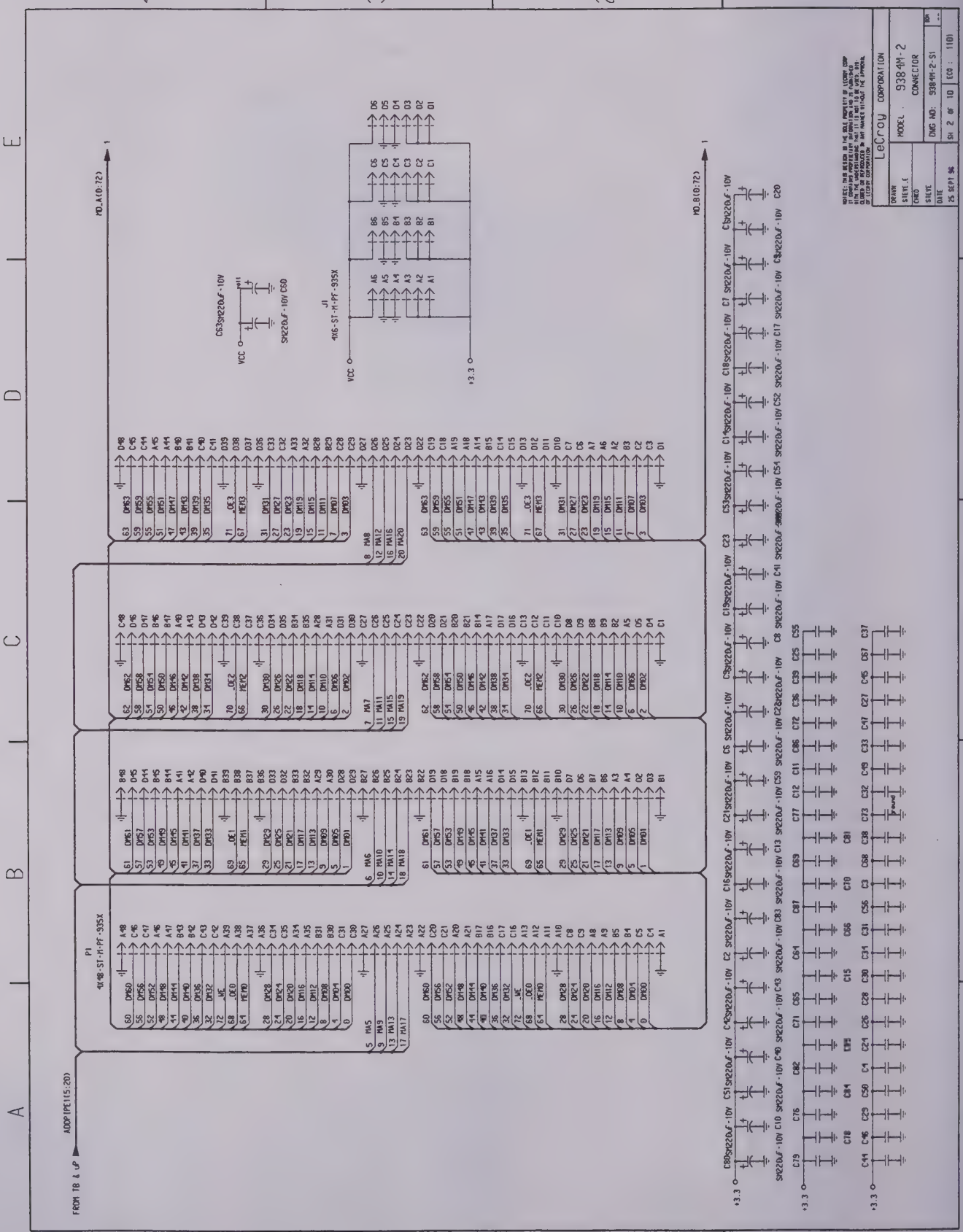
Location	Part Number	Description	Location	Part Number	Description
R49	SM652101220	SM22S	R93	SM652101102	SM1KS
R50	SM652101122	SM1.2KS	R94	SM652101102	SM1KS
R51	SM652101334	SM330KS	R95	SM652101102	SM1KS
R52	SM652101102	SM1KS	R96	SM652101102	SM1KS
R53	SM652101222	SM2.2KS	R97	SM652101511	SM510S
R54	SM652101241	SM240S	R98	SM652101102	SM1KS
R55	SM652101151	SM150S	R100	SM652101102	SM1KS
R56	SM652101151	SM150S	R101	SM652101100	SM10S
R57	SM652101102	SM1KS	R102	SM652101151	SM150S
R58	SM652101103	SM10KS	R103	SM652101102	SM1KS
R59	SM652101103	SM10KS	R104	SM652101511	SM510S
R60	SM652101103	SM10KS	R105	SM652101102	SM1KS
R61	SM652101102	SM1KS	R106	SM652101102	SM1KS
R62	SM652101103	SM10KS	R107	SM652101470	SM47S
R63	SM652101103	SM10KS	R108	SM652101474	SM470KS
R64	SM652101103	SM10KS	R109	SM652101331	SM330S
R65	SM652101151	SM150S	R110	SM652101103	SM10KS
R66	SM652101102	SM1KS	R111	SM652101151	SM150S
R67	SM652101103	SM10KS	R112	SM652101470	SM47S
R68	SM652101220	SM22S	R113	SM652101102	SM1KS
R69	SM652101103	SM10KS	R114	SM652101511	SM510S
R70	SM652101220	SM22S	R115	SM652101103	SM10KS
R71	SM652101220	SM22S	R116	SM652101102	SM1KS
R72	SM652101220	SM22S	R117	SM652101103	SM10KS
R73	SM652101220	SM22S	R118	SM652101511	SM510S
R74	SM652101100	SM10S	R119	SM652101103	SM10KS
R75	SM652101100	SM10S	R120	SM652101103	SM10KS
R76	SM652101102	SM1KS	R121	SM652101103	SM10KS
R77	SM652101102	SM1KS	R122	SM652101102	SM1KS
R78	SM652101102	SM1KS	R123	SM652101102	SM1KS
R79	SM652101102	SM1KS	R124	SM652101511	SM510S
R80	SM652101102	SM1KS	R125	SM652101103	SM10KS
R82	SM652101820	SM82S	R126	SM652101102	SM1KS
R83	SM652101103	SM10KS	R127	SM652101511	SM510S
R84	SM652101102	SM1KS	R128	SM652101511	SM510S
R85	SM652101102	SM1KS	R129	SM652101103	SM10KS
R86	SM652101102	SM1KS	R130	SM652101102	SM1KS
R87	SM652101102	SM1KS	R131	SM652101103	SM10KS
R88	SM652101220	SM22S	R132	SM652101220	SM22S
R89	SM652101102	SM1KS	R133	SM652101220	SM22S
R90	SM652101102	SM1KS	R134	SM652101220	SM22S
R91	SM652101102	SM1KS	R135	SM652101220	SM22S

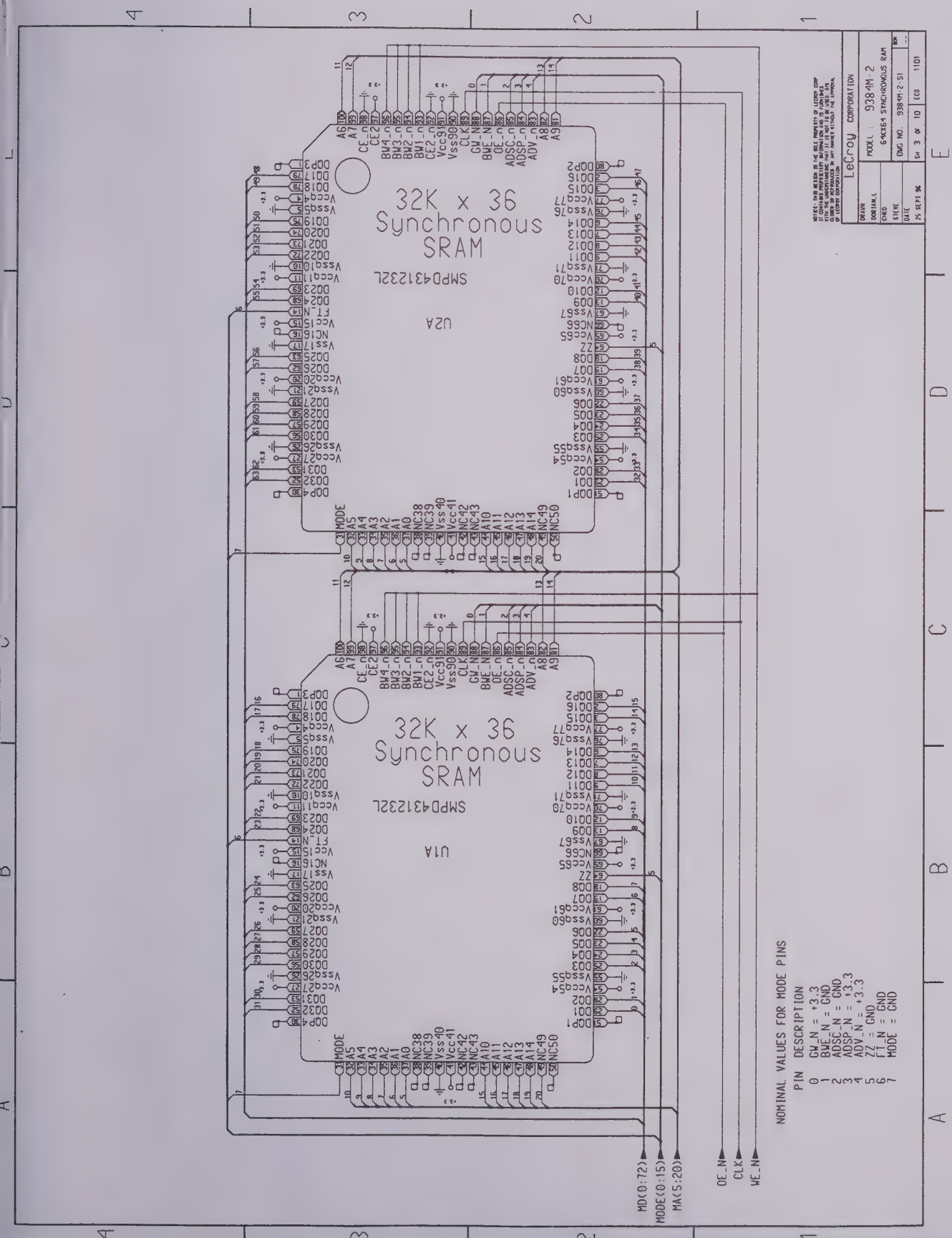
PART: F9601-1-X DESC : PROCESSOR with 8Mb or 64Mb RAM

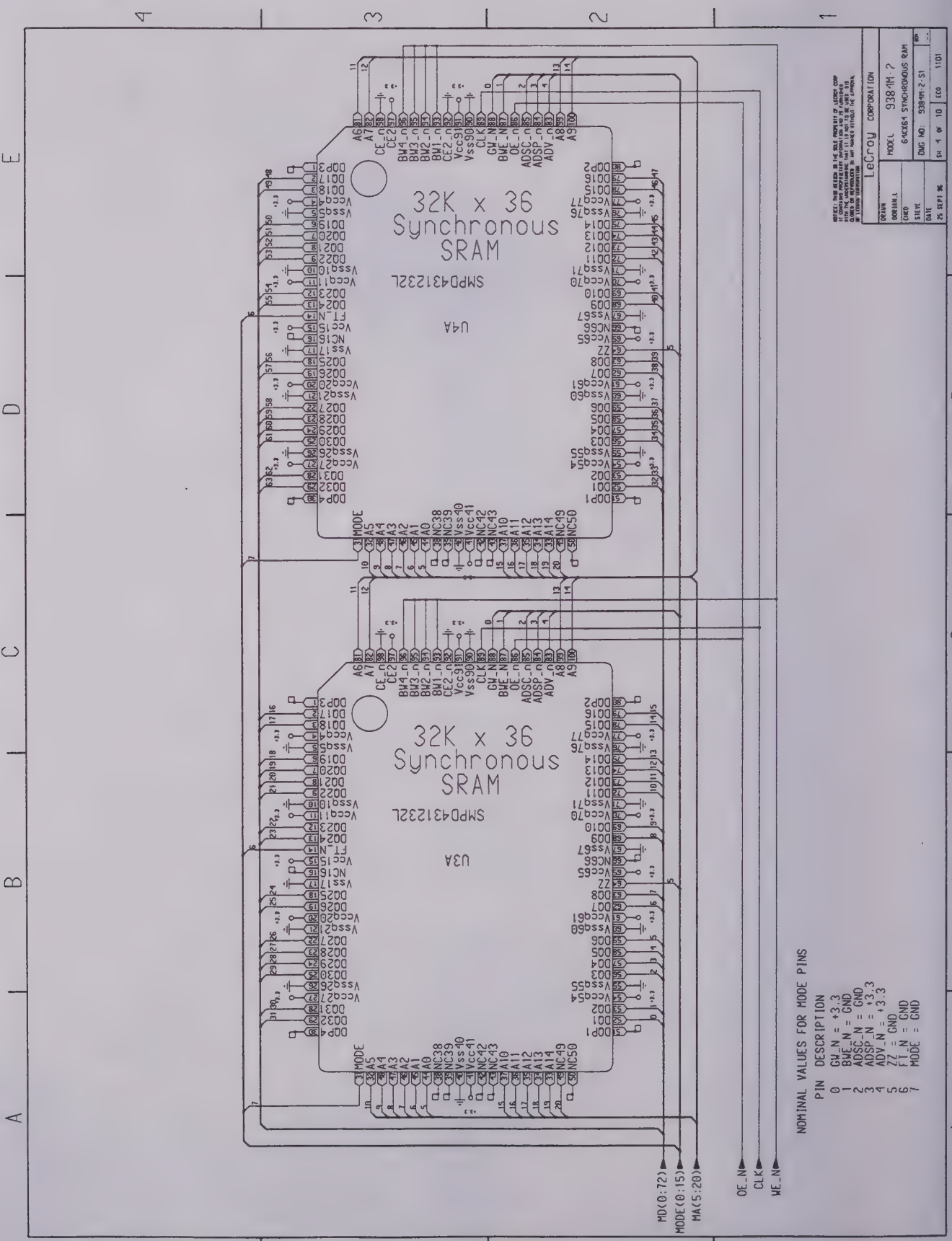
Location	Part Number	Description	Location	Part Number	Description
R136	SM652101103	SM10KS	R176	SM652101472	SM4.7KS
R137	SM652101103	SM10KS	R177	SM652101102	SM1KS
R138	SM652101102	SM1KS	R178	SM652101510	SM51S
R139	SM652101220	SM22S	R179	SM652101472	SM4.7KS
R140	SM652101220	SM22S	R180	SM652101472	SM4.7KS
R141	SM652101220	SM22S	R181	SM652101472	SM4.7KS
R142	SM652101220	SM22S	R182	SM652101472	SM4.7KS
R143	SM652101220	SM22S	R183	SM652101153	SM15KS
R144	SM652101220	SM22S	R184	SM652101472	SM4.7KS
R145	SM652101220	SM22S	R185	SM652101102	SM1KS
R146	SM652101220	SM22S	R186	SM652101510	SM51S
R147	SM652101101	SM100S	R187	SM652101102	SM1KS
R148	SM652101102	SM1KS	R188	SM652101820	SM82S
R149	SM652101152	SM1.5KS	R189	SM652101102	SM1KS
R150	SM652101102	SM1KS	R190	SM652101102	SM1KS
R151	SM652101103	SM10KS	R191	SM652101510	SM51S
R152	SM652101220	SM22S	R192	SM652101472	SM4.7KS
R153	SM652101220	SM22S	R193	SM652101472	SM4.7KS
R154	SM652101220	SM22S	R194	SM652101472	SM4.7KS
R155	SM652101220	SM22S	R195	SM652101510	SM51S
R156	SM652101472	SM4.7KS	R196	SM652101510	SM51S
R157	SM652101472	SM4.7KS	R197	SM652101510	SM51S
R158	SM652101472	SM4.7KS	R198	SM652101510	SM51S
R159	SM652101472	SM4.7KS	R199	SM652101510	SM51S
R160	SM652101153	SM15KS	R200	SM652101510	SM51S
R161	SM652101241	SM240S	R201	SM652101103	SM10KS
R162	SM652101152	SM1.5KS	R202	SM652101103	SM10KS
R163	SM652101152	SM1.5KS	R203	SM652101511	SM510S
R164	SM652101472	SM4.7KS	R204	SM652101150	SM15S
R165	SM654101000	SM0S	R205	SM652101472	SM4.7KS
R166	SM652101472	SM4.7KS	R206	SM654101000	SM0S
R167	SM652101472	SM4.7KS	S1	SM654101000	SM0S-2P
R168	SM652101472	SM4.7KS	S2	SM654101000	SM0S-2P
R169	SM652101472	SM4.7KS	S3	SM652101102	SM1KS-2P
R170	SM652101472	SM4.7KS	S4	SM652101102	SM1KS-2P
R171	SM652101472	SM4.7KS	S5	SM652101102	SM1KS-2P
R172	SM652101472	SM4.7KS	S6	SM652101102	SM1KS-2P
R173	SM652101472	SM4.7KS	S7	SM654101000	SM0S-2P
R174	SM652101472	SM4.7KS	Y1	SM310300406	SM32.768KHz
R175	SM652101472	SM4.7KS	Y2	SM310900024	SM24MHz


NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
DATA BUS A
ADDRESS BUS
DATA BUS B
MD_A(0:72) FROM_PAGE 3
ADDPIPE1(5:20) FROM_PAGE 3
MD_B(0:72) FROM_PAGE 3
LeCroy CORPORATION
MODEL 9384M-2
ACQUISITION MEMORY

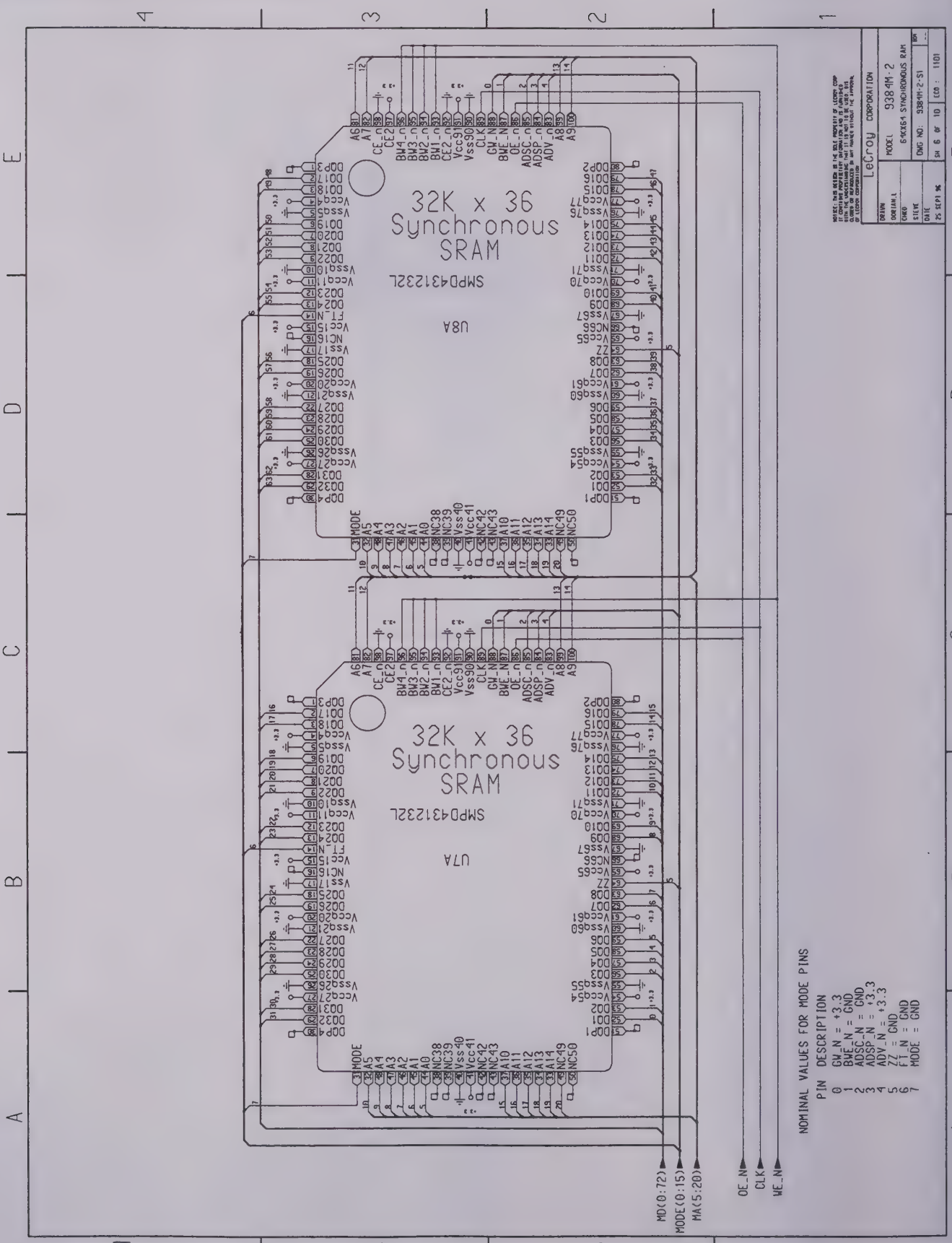
Schematics, Layouts

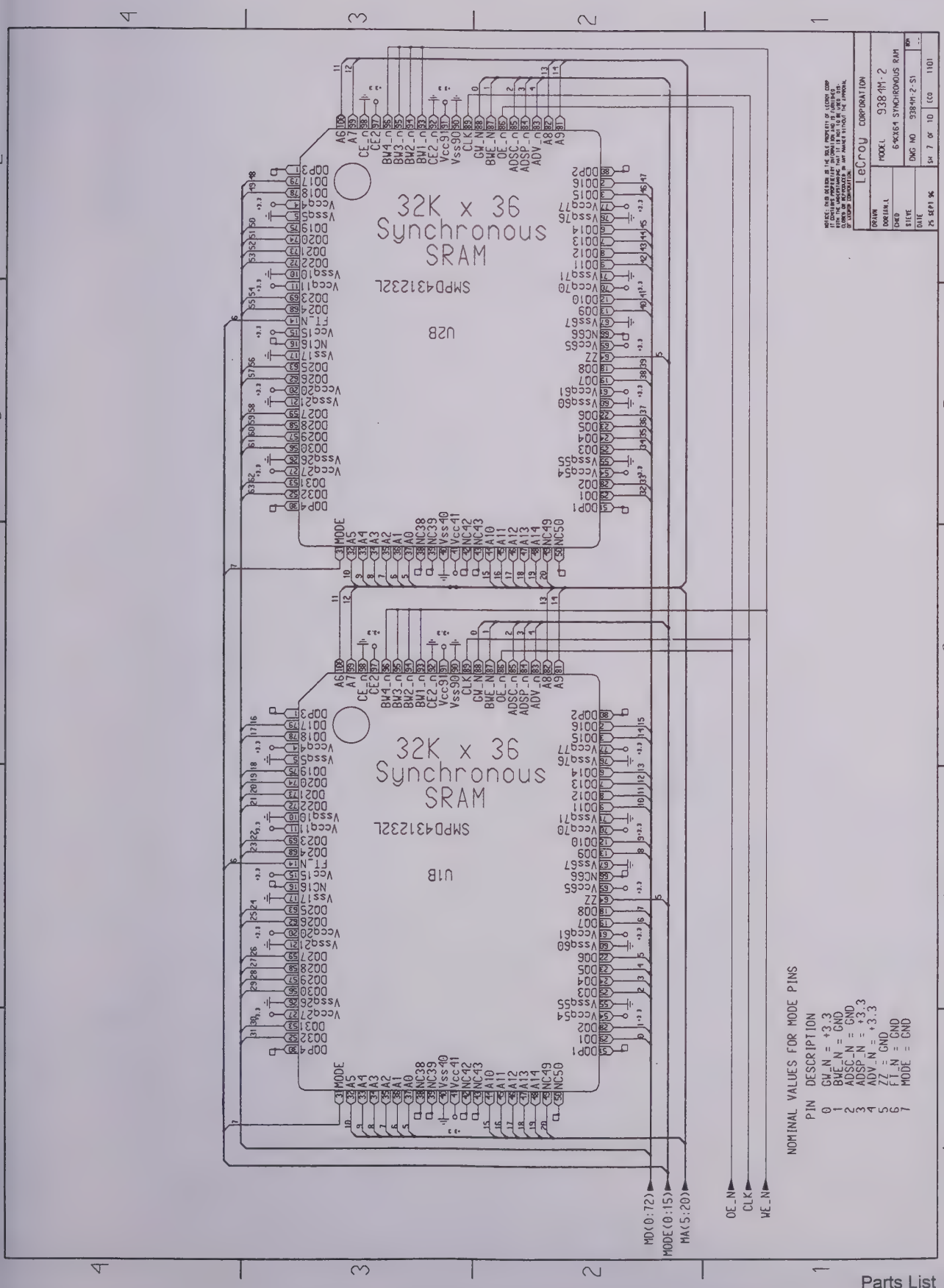


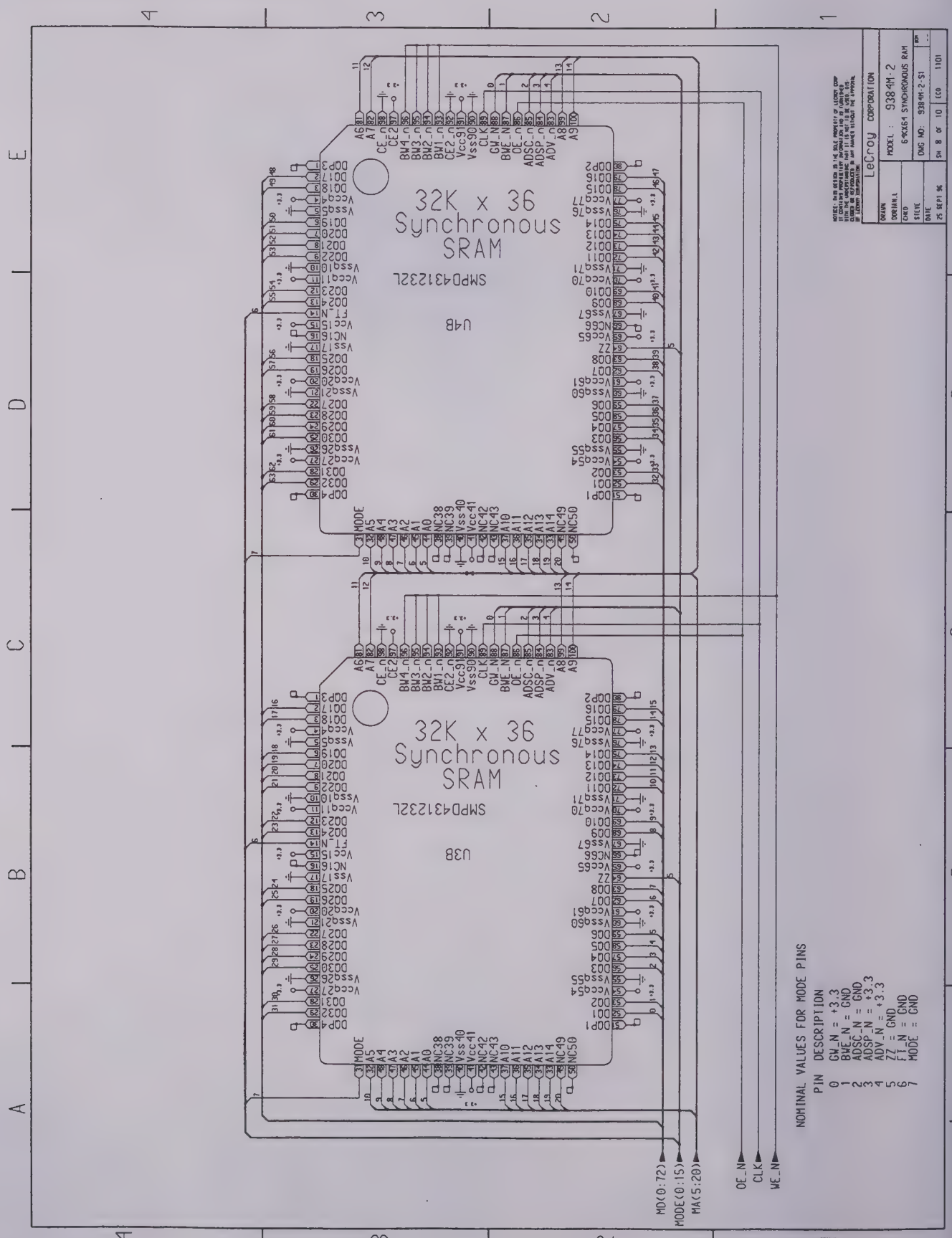

32K x 36
Synchronous
SRAM
SMPD4312 32L
U2A
U1A
LeCroy CORPORATION
MODEL : 9384M-2
64KX64 SYNCHRONOUS RAM
DWG NO. 9384M-2-S1
SH 3 OF 10
ECO 1101
25 SEPT 96
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N

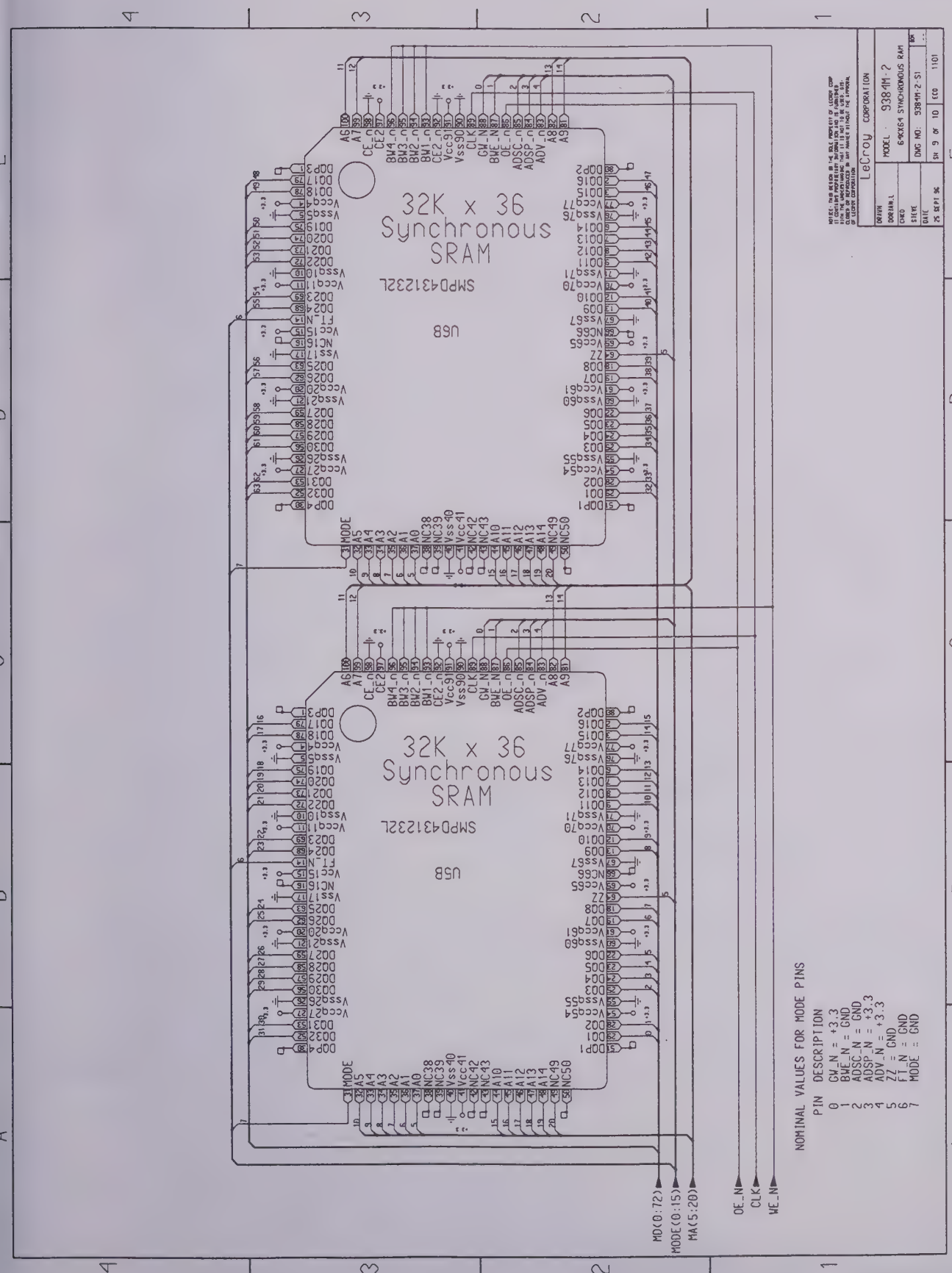

32K x 36
Synchronous
SRAM
SMPD431232L
U4A
U3A
MODE
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384M-2
64Kx64 SYNCHRONOUS RAM
DWG NO. 9384M-2-S1
25 SEP 96

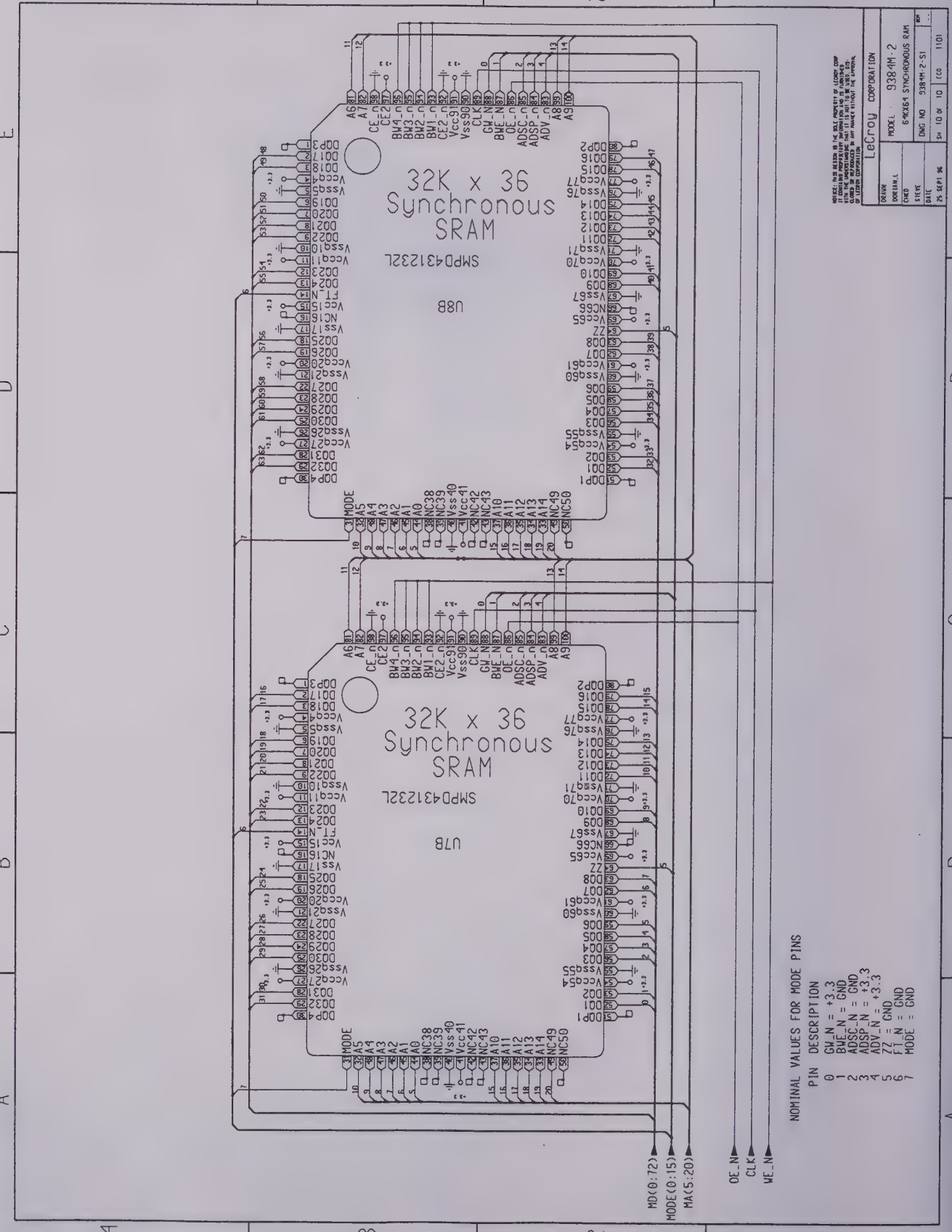
32K x 36
Synchronous
SRAM
SMPD431232L
U6A
U5A
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384M-2
64K/64 SYNCHRONOUS RAM
DWG NO 9384M-2-SI
SH 5 OF 10
ECO 1101


32K x 36
Synchronous
SRAM
SMPD431232L
U8A
U7A
LeCroy CORPORATION
MODEL 9384M-2
64Kx64 SYNCHRONOUS RAM
DRAWN DONTAN.L
CHKD
STATE
DATE
DWG NO: 9384M-2-SI
SH 6 OF 10 ECO : 1101
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N

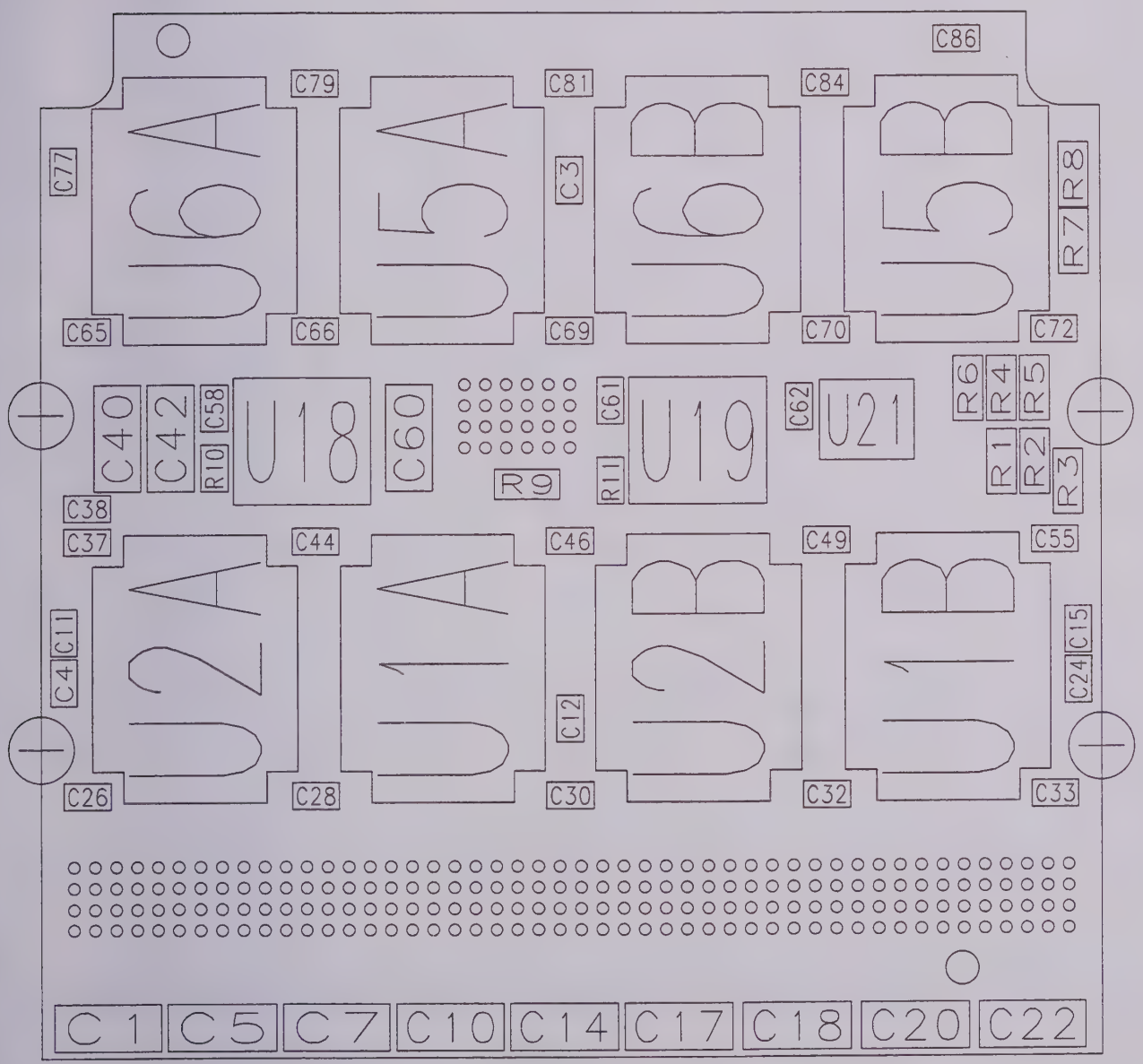

32K x 36
Synchronous
SRAM
SMPD431232L
U2B
U1B
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384M-2
6.4GX64 SYNCHRONOUS RAM
DWG NO 9384M-2-S1
25 SEP1 96


32K x 36
Synchronous
SRAM
SMPD431232L
U8B
U3B
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL : 9384M-2
6-4X16-1 SYNCHRONOUS RAM
DWG NO: 9384M-2-S1
SH 8 OF 10

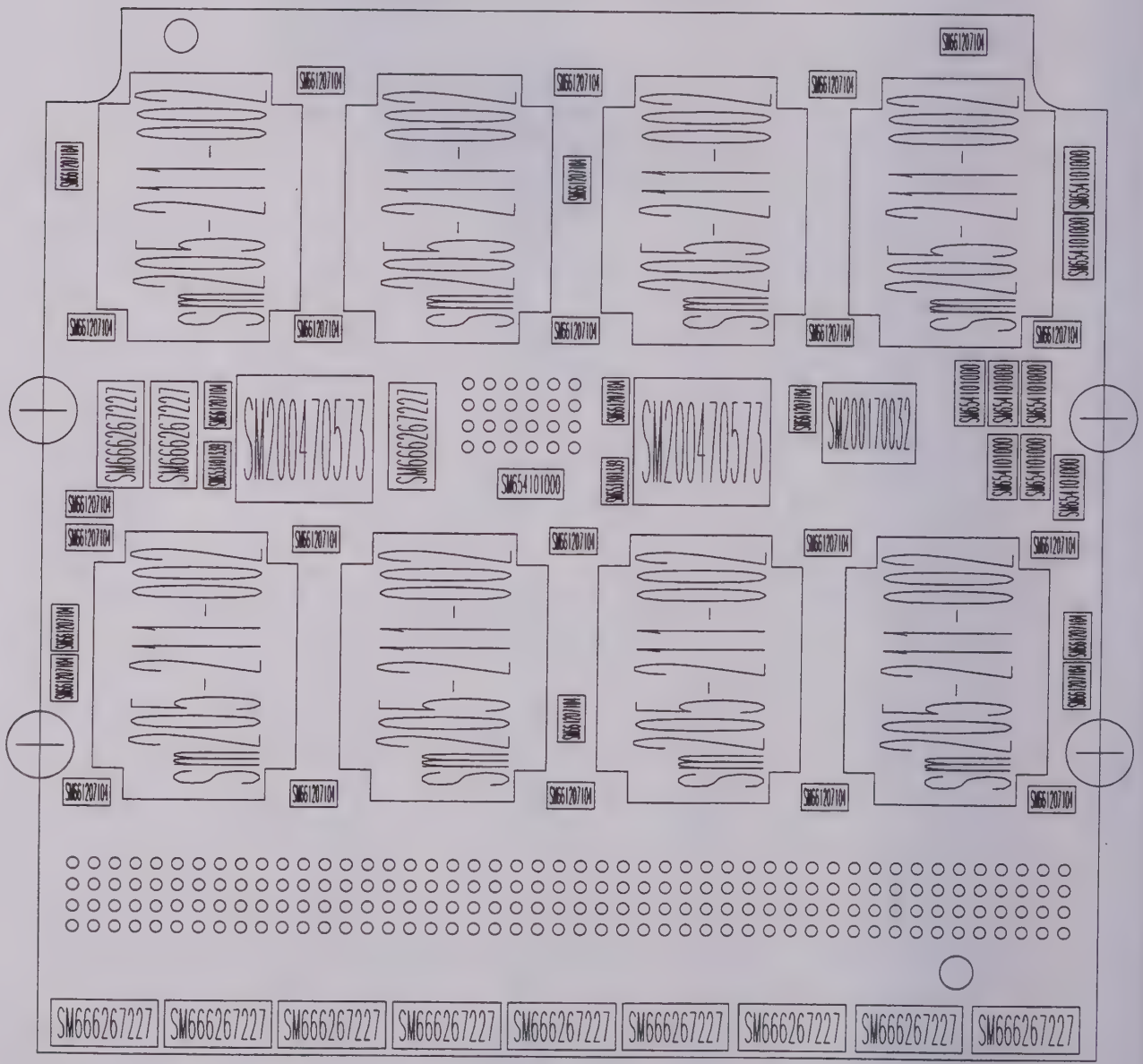

32K x 36
Synchronous
SRAM
SMPD4312 32L
U6B
U5B
LeCroy CORPORATION
MODEL 9384M-2
64KX64 SYNCHRONOUS RAM
DWG NO: 9384M-2-S1
SH 9 OF 10
ECO 1101
25 SEPT 96
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N


32K x 36
Synchronous
SRAM
SMP0431232L
U8B
U7B
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = +3.3
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = +3.3
4 ADV_N = +3.3
5 ZZ = GND
6 FT_N = GND
7 MODE = GND
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384M-2
6-MX64 SYNCHRONOUS RAM
DWG NO 9384M-2-SI
25 SEP 96
SH 10 OF 10
1101

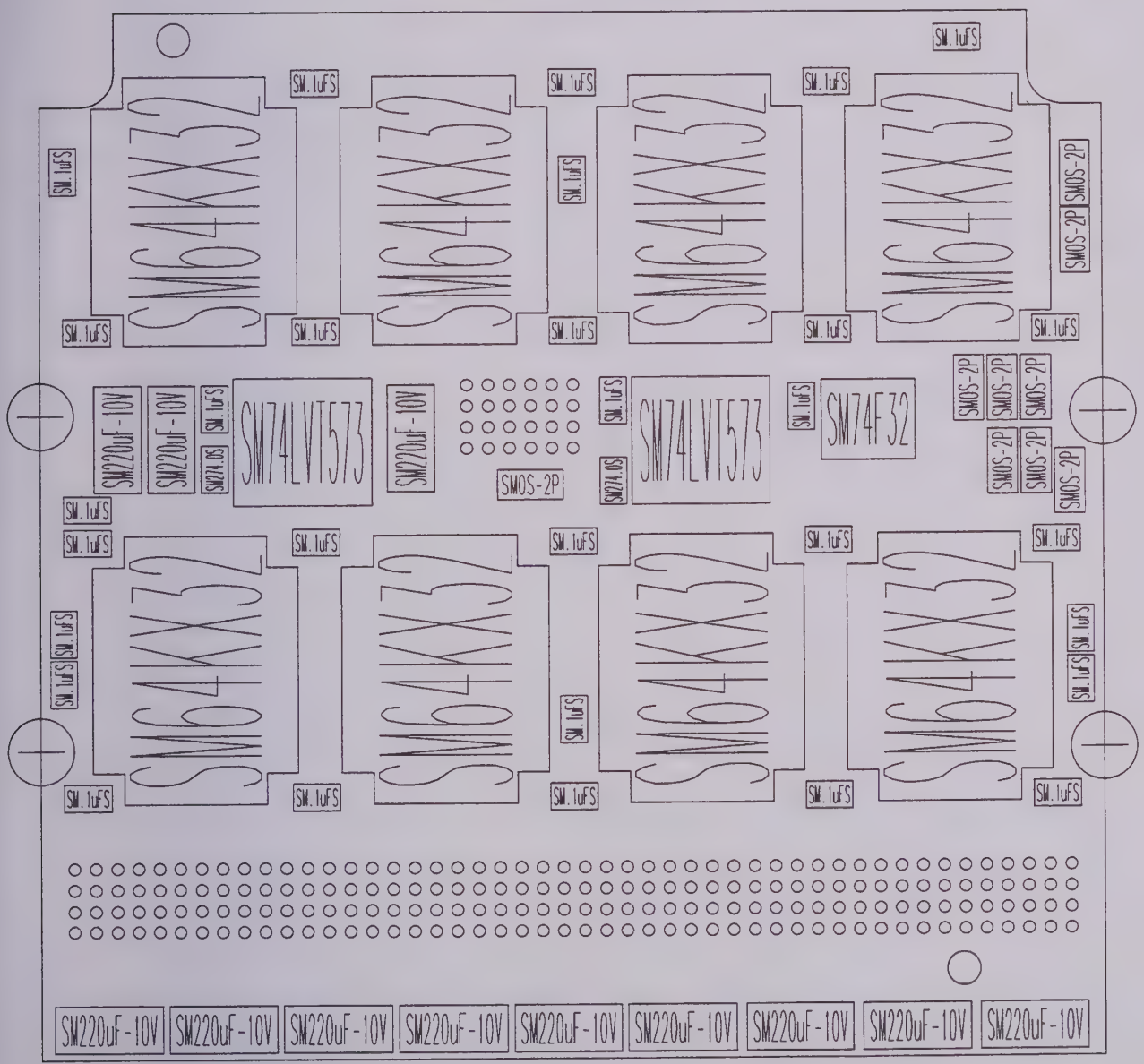
9384M-2 Rev B Side 1



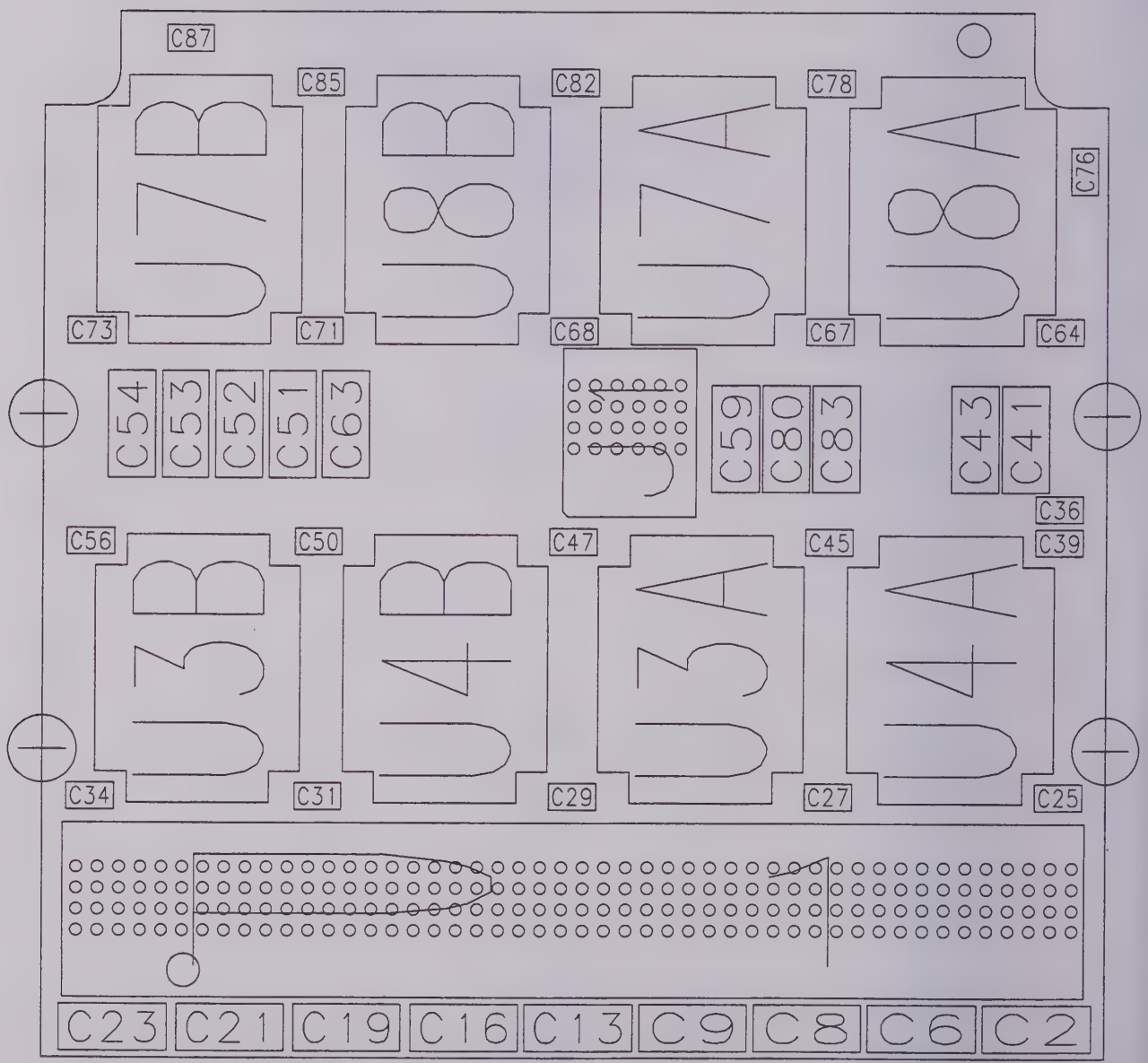
9384M-2 Rev B Side 1



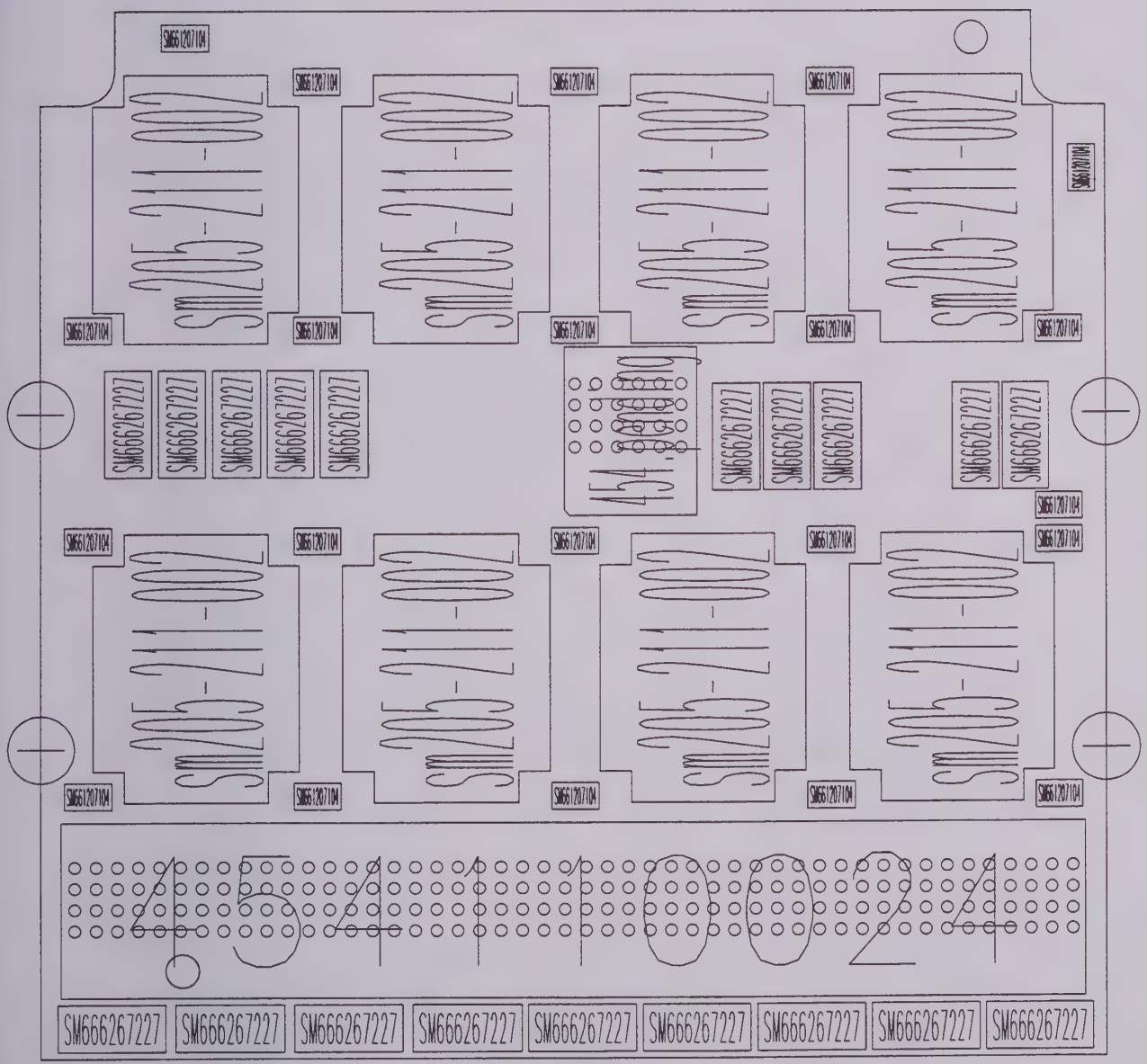
9384M-2 Rev B Side 1



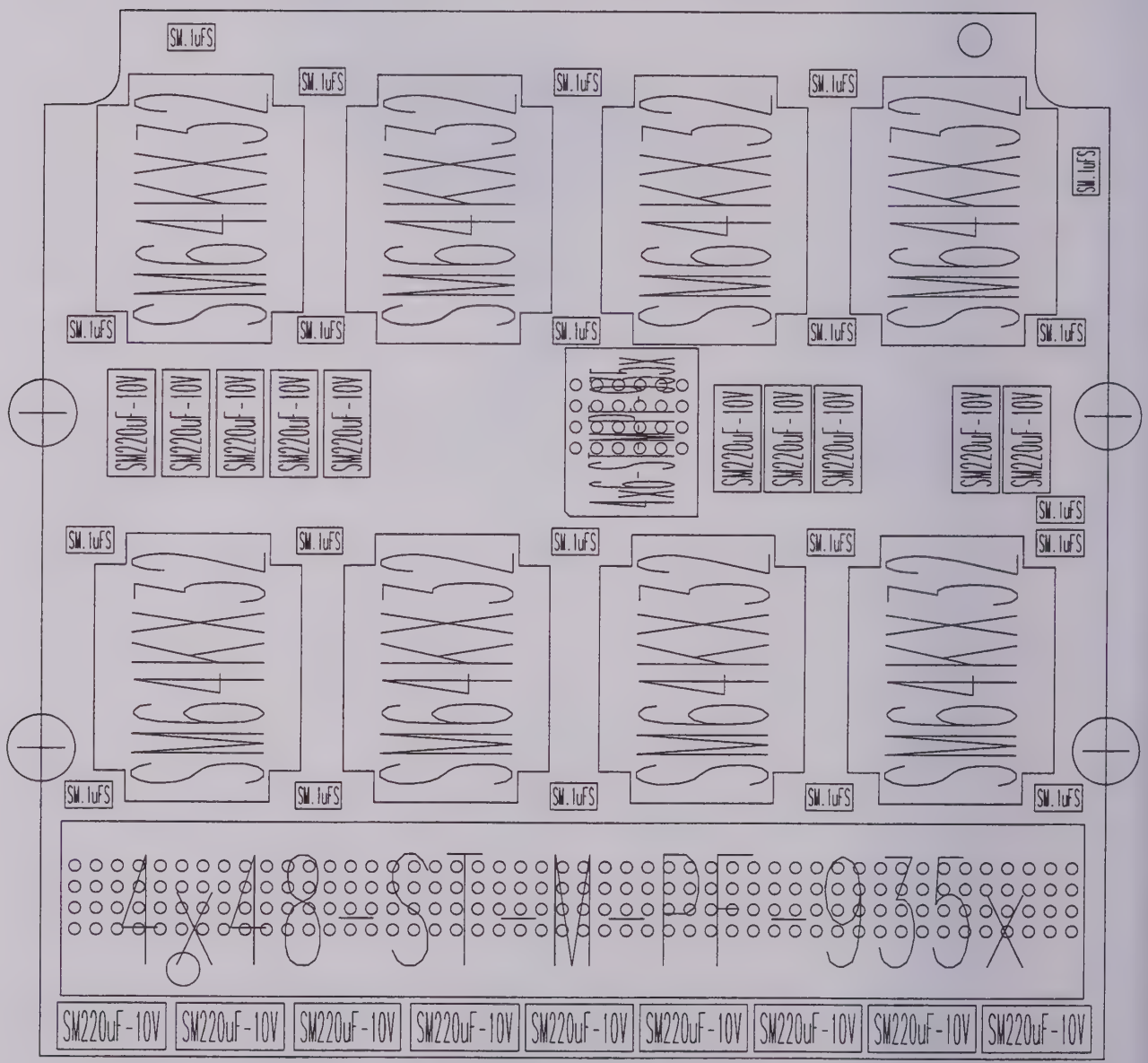
9384M-2 Rev B Side 2



9384M-2 Rev B Side 2



9384M-2 Rev B Side 2

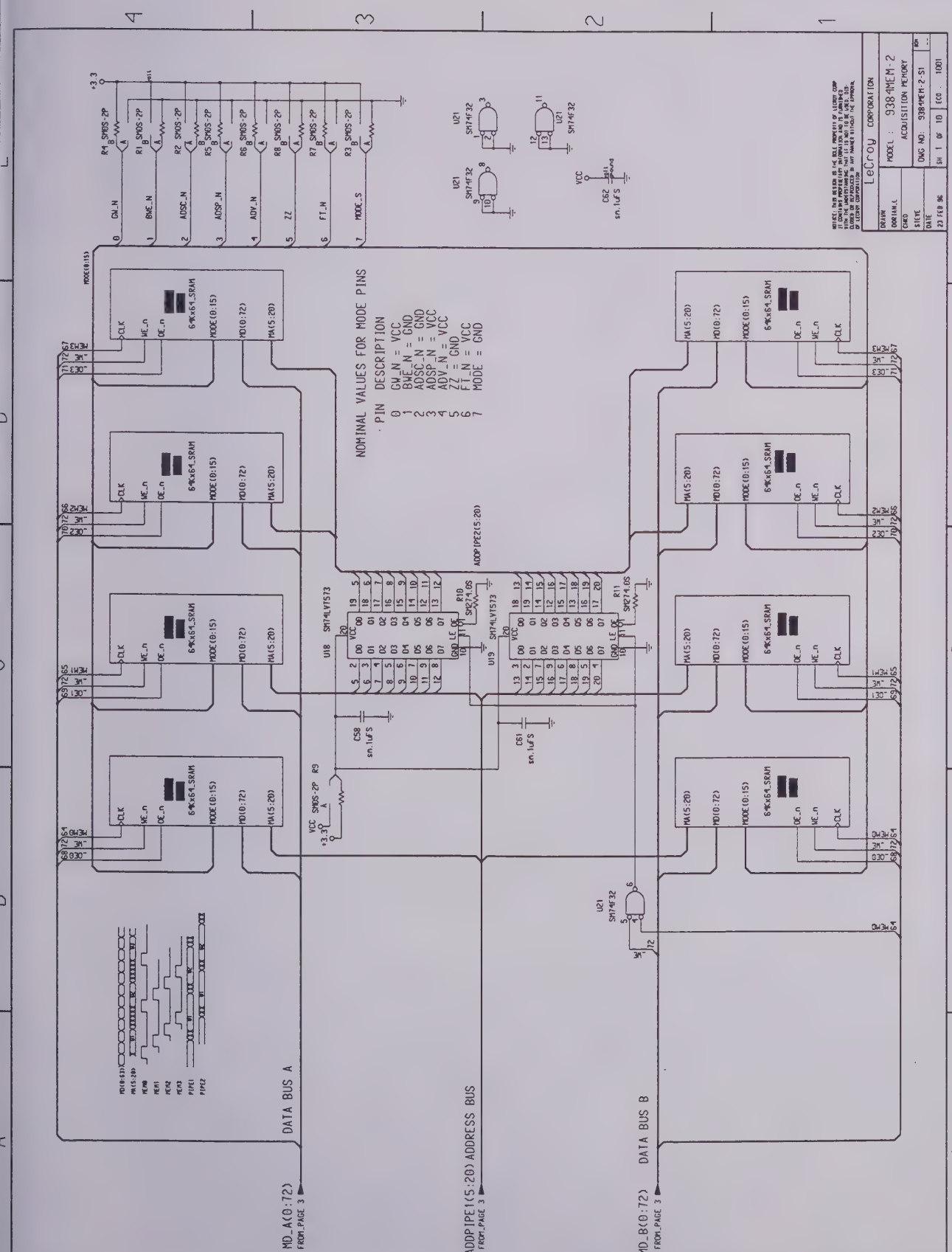


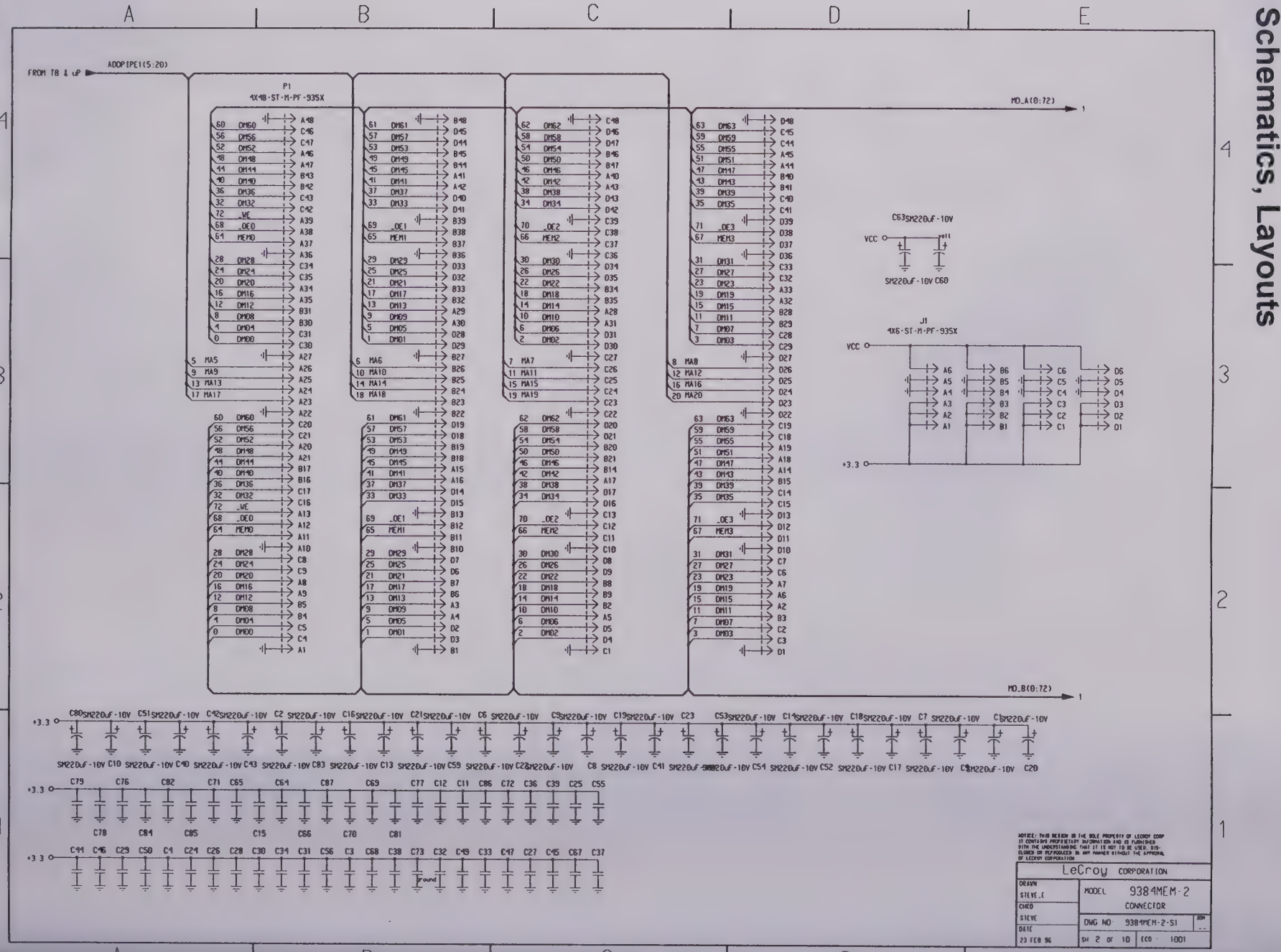
PART: 9384M-2 **DESC : Acquisition Memory Card with 2 X 500K**

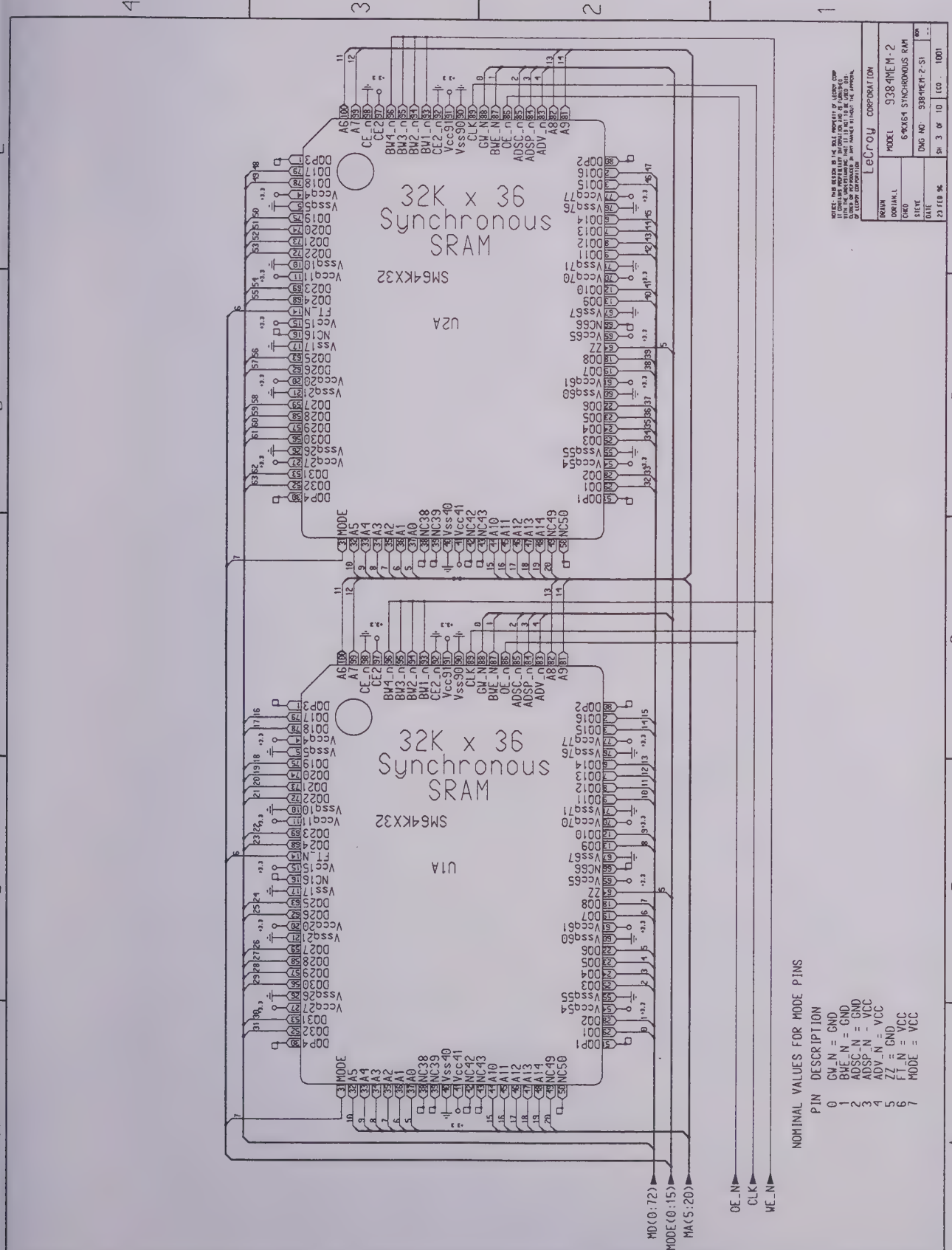
Location	Part Number	Description	Location	Part Number	Description
C1	SM666267227	SM220UF	C44	SM661207104	SM.1UF
C2	SM666267227	SM220UF	C45	SM661207104	SM.1UF
C3	SM661207104	SM.1UF	C46	SM661207104	SM.1UF
C4	SM661207104	SM.1UF	C47	SM661207104	SM.1UF
C5	SM666267227	SM220UF	C48	SM666267227	SM220UF
C6	SM666267227	SM220UF	C49	SM661207104	SM.1UF
C7	SM666267227	SM220UF	C50	SM661207104	SM.1UF
C8	SM666267227	SM220UF	C51	SM666267227	SM220UF
C9	SM666267227	SM220UF	C52	SM666267227	SM220UF
C10	SM666267227	SM220UF	C53	SM666267227	SM220UF
C11	SM661207104	SM.1UF	C54	SM666267227	SM220UF
C12	SM661207104	SM.1UF	C55	SM661207104	SM.1UF
C13	SM666267227	SM220UF	C56	SM661207104	SM.1UF
C14	SM666267227	SM220UF	C57	SM666267227	SM220UF
C15	SM661207104	SM.1UF	C58	SM661207104	SM.1UF
C16	SM666267227	SM220UF	C59	SM666267227	SM220UF
C17	SM666267227	SM220UF	C60	SM666267227	SM220UF
C18	SM666267227	SM220UF	C61	SM661207104	SM.1UF
C19	SM666267227	SM220UF	C62	SM661207104	SM.1UF
C20	SM666267227	SM220UF	C63	SM666267227	SM220UF
C21	SM666267227	SM220UF	C64	SM661207104	SM.1UF
C22	SM666267227	SM220UF	C65	SM661207104	SM.1UF
C23	SM666267227	SM220UF	C66	SM661207104	SM.1UF
C24	SM661207104	SM.1UF	C67	SM661207104	SM.1UF
C25	SM661207104	SM.1UF	C68	SM661207104	SM.1UF
C26	SM661207104	SM.1UF	C69	SM661207104	SM.1UF
C27	SM661207104	SM.1UF	C70	SM661207104	SM.1UF
C28	SM661207104	SM.1UF	C71	SM661207104	SM.1UF
C29	SM661207104	SM.1UF	C72	SM661207104	SM.1UF
C30	SM661207104	SM.1UF	C73	SM661207104	SM.1UF
C31	SM661207104	SM.1UF	C74	SM661207104	SM.1UF
C32	SM661207104	SM.1UF	C75	SM661207104	SM.1UF
C33	SM661207104	SM.1UF	C76	SM661207104	SM.1UF
C34	SM661207104	SM.1UF	C77	SM661207104	SM.1UF
C35	SM666267227	SM220UF	C78	SM661207104	SM.1UF
C36	SM661207104	SM.1UF	C79	SM661207104	SM.1UF
C37	SM661207104	SM.1UF	C80	SM666267227	SM220UF
C38	SM661207104	SM.1UF	C81	SM661207104	SM.1UF
C39	SM661207104	SM.1UF	C82	SM661207104	SM.1UF
C40	SM666267227	SM220UF	C83	SM666267227	SM220UF
C41	SM666267227	SM220UF	C84	SM661207104	SM.1UF
C42	SM666267227	SM220UF	C85	SM661207104	SM.1UF
C43	SM666267227	SM220UF	C86	SM661207104	SM.1UF

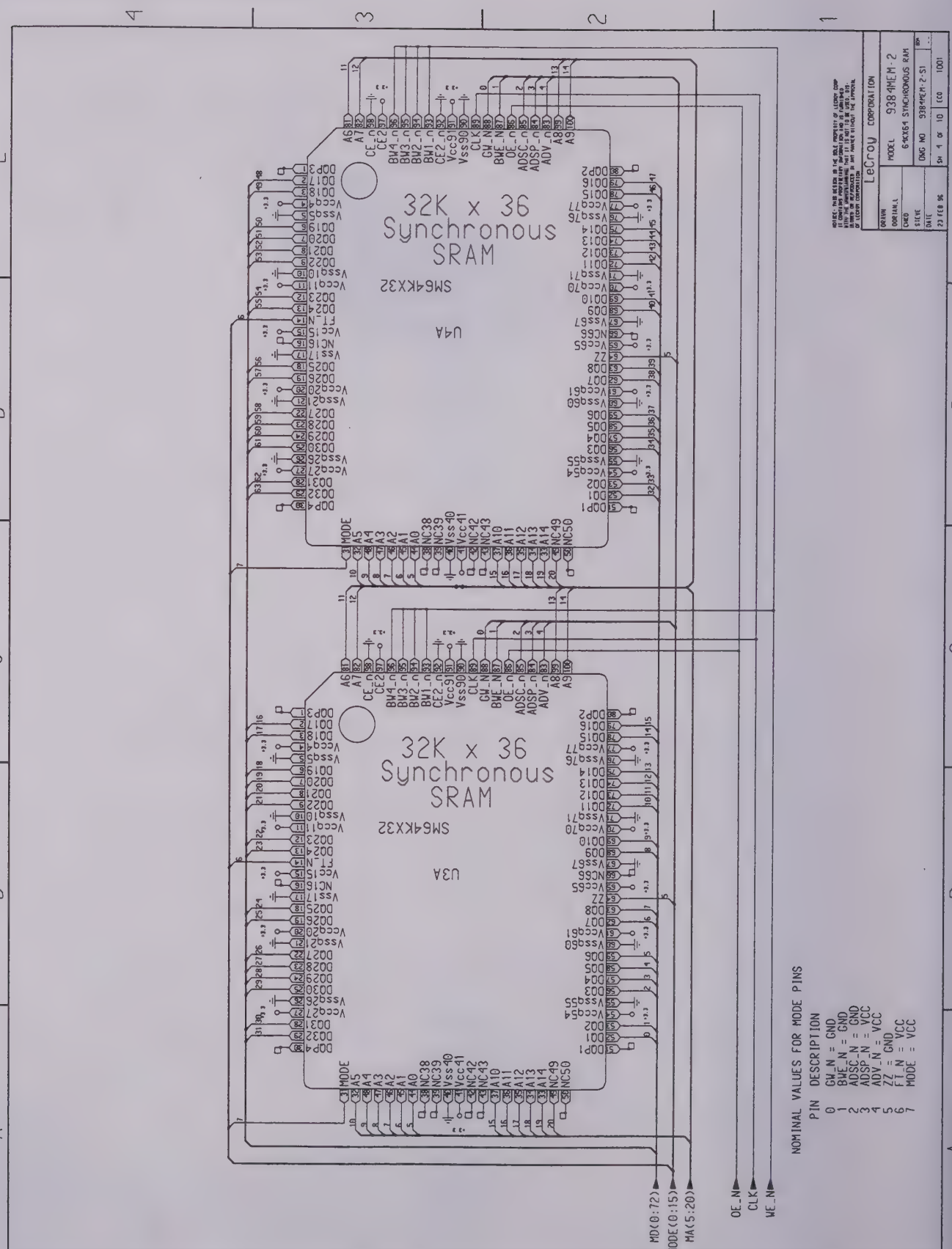
PART: 9384M-2 **DESC : Acquisiton Memory Card with 2 X 500K**

Location	Part Number	Description
C87	SM661207104	SM.1UF
J1	454110024	2MM HDR
P1	454110024	2MM HDR
R1	SM654101000	SMZEROOHM
R2	SM654101000	SMZEROOHM
R3	SM654101000	SMZEROOHM
R4	SM654101000	SMZEROOHM
R5	SM654101000	SMZEROOHM
R6	SM654101000	SMZEROOHM
R7	SM654101000	SMZEROOHM
R8	SM654101000	SMZEROOHM
R9	SM652101750	SM75.0OHM
R10	SM652101750	SM75.0OHM
U1	SM191160750	SM75OHMRC
U1A	SM205211001	SM32K SRAM
U1B	SM205211001	SM32K SRAM
U2	SM191160750	SM75OHMRC
U2A	SM205211001	SM32K SRAM
U2B	SM205211001	SM32K SRAM
U3	SM191160750	SM75OHMRC
U3A	SM205211001	SM32K SRAM
U3B	SM205211001	SM32K SRAM
U4	SM191160750	SM75OHMRC
U4A	SM205211001	SM32K SRAM
U4B	SM205211001	SM32K SRAM
U5	SM191160750	SM75OHMRC
U5A	SM205211001	SM32K SRAM
U5B	SM205211001	SM32K SRAM
U6	SM191160750	SM75OHMRC
U6A	SM205211001	SM32K SRAM
U6B	SM205211001	SM32K SRAM
U7	SM191160750	SM75OHMRC
U7A	SM205211001	SM32K SRAM
U7B	SM205211001	SM32K SRAM
U8	SM191160750	SM75OHMRC
U8A	SM205211001	SM32K SRAM
U8B	SM205211001	SM32K SRAM
U9	SM191160750	SM75OHMRC
U10	SM191160750	SM75OHMRC
U11	SM191160750	SM75OHMRC
U12	SM191160750	SM75OHMRC
U13	SM191160750	SM75OHMRC
U14	SM191160750	SM75OHMRC
U15	SM191160750	SM75OHMRC
U16	SM191160750	SM75OHMRC
U17	SM191160750	SM75OHMRC
U18	SM200479573	SM74ABT573
U19	SM200479573	SM74ABT573
U20	SM191160750	SM75OHMRC
U21	SM200170032	SM74F32

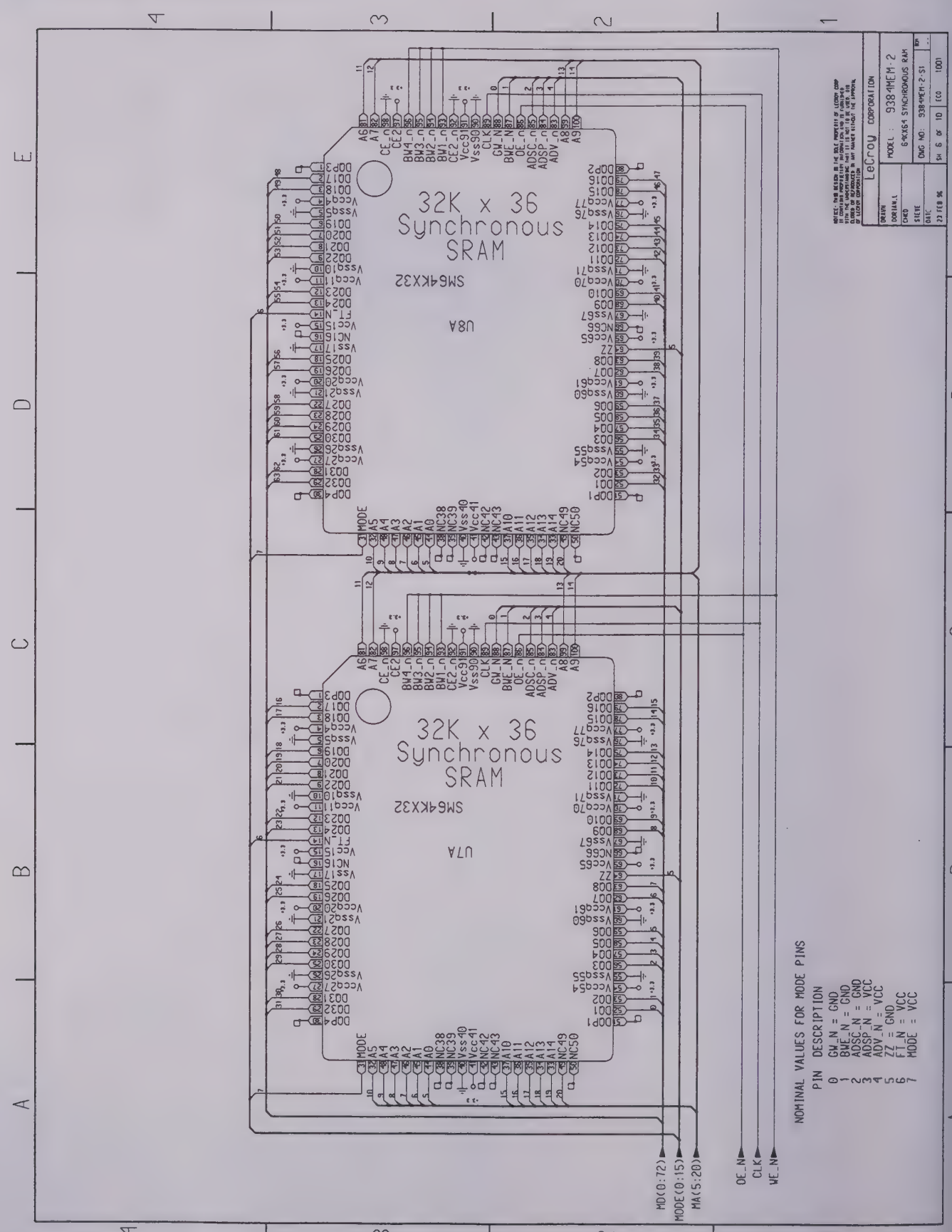

NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = VCC
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = GND
LeCroy CORPORATION
MODEL : 9384MEM-2
ACQUISITION MEMORY
DWG NO: 9384MEM-2-S1
SH 1 OF 10
DATA BUS A
ADDRESS BUS
DATA BUS B
MD_A(0:72)
ADDPIPE1(5:20)
MD_B(0:72)
FROM_PAGE 3

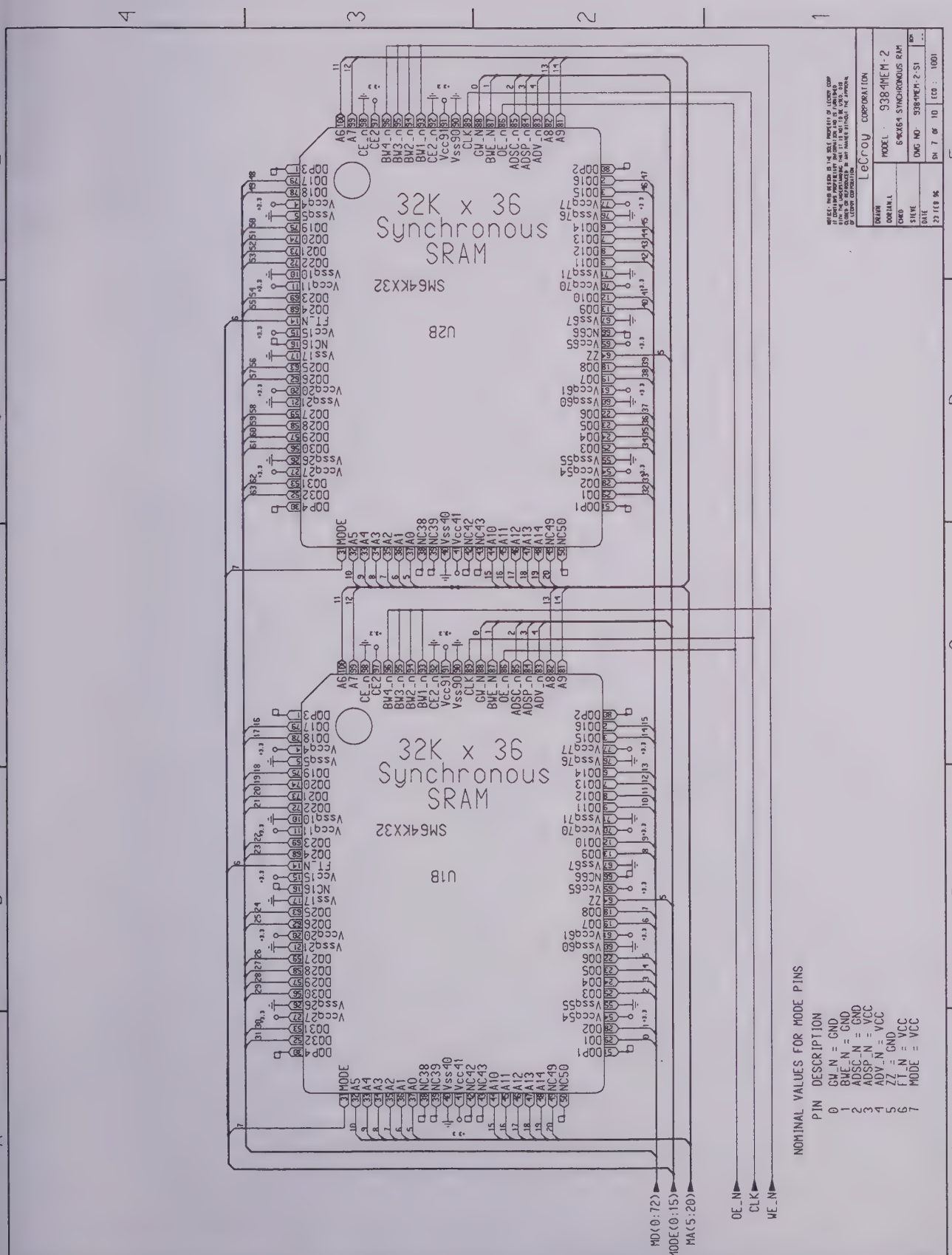

FROM TB & uP
ADDPIPE1(5:20)
P1
4X48-ST-M-PF-935X
MD_A(0:72)
MD_B(0:72)
C63SM220uF-10V
VCC
SM220uF-10V C60
J1
4X6-ST-M-PF-935X
+3.3
LeCroy CORPORATION
DRAWN STEVE.E
CHKD STEVE
DATE 23 FEB 96
MODEL 9384MEM-2
CONNECTOR
DWG NO 9384MEM-2-S1
SH 2 OF 10
ECO 1001

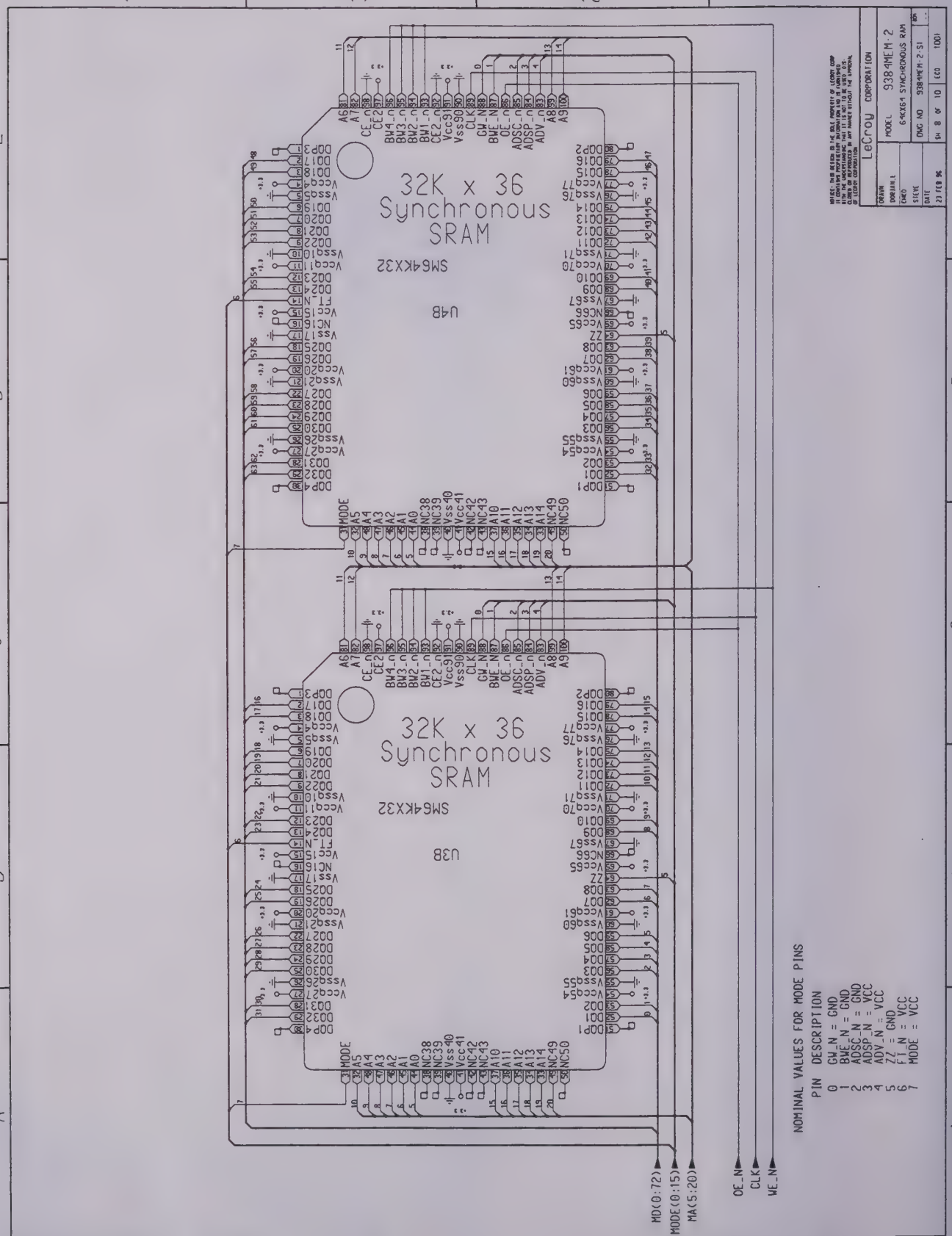

32K x 36
Synchronous
SRAM
SM64KX32
U2A
U1A
MODE
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384MEM-2
64Kx64 SYNCHRONOUS RAM
DWG NO: 9384MEM-2-SI
SH 3 OF 10
ECO: 1001
23 FEB 96

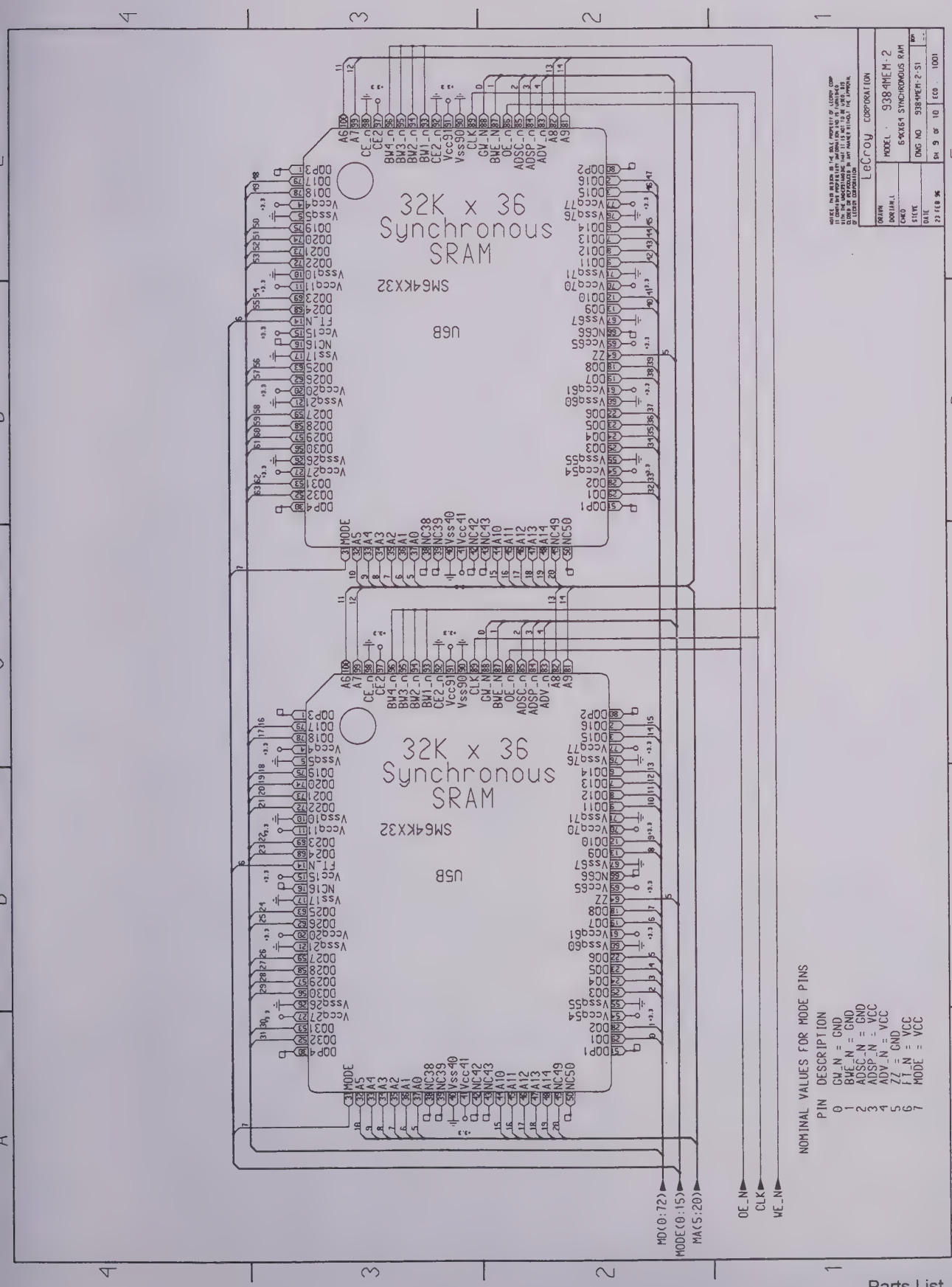

32K x 36
Synchronous
SRAM
SM64KX32
U4A
U3A
LeCroy CORPORATION
MODEL 9384MEM-2
64KX64 SYNCHRONOUS RAM
DWG NO 9384MEM-2-S1
SH 4 OF 10
ECO 1001
DRAWN
CHKD
STEVE
DATE
23 FEB 96
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N

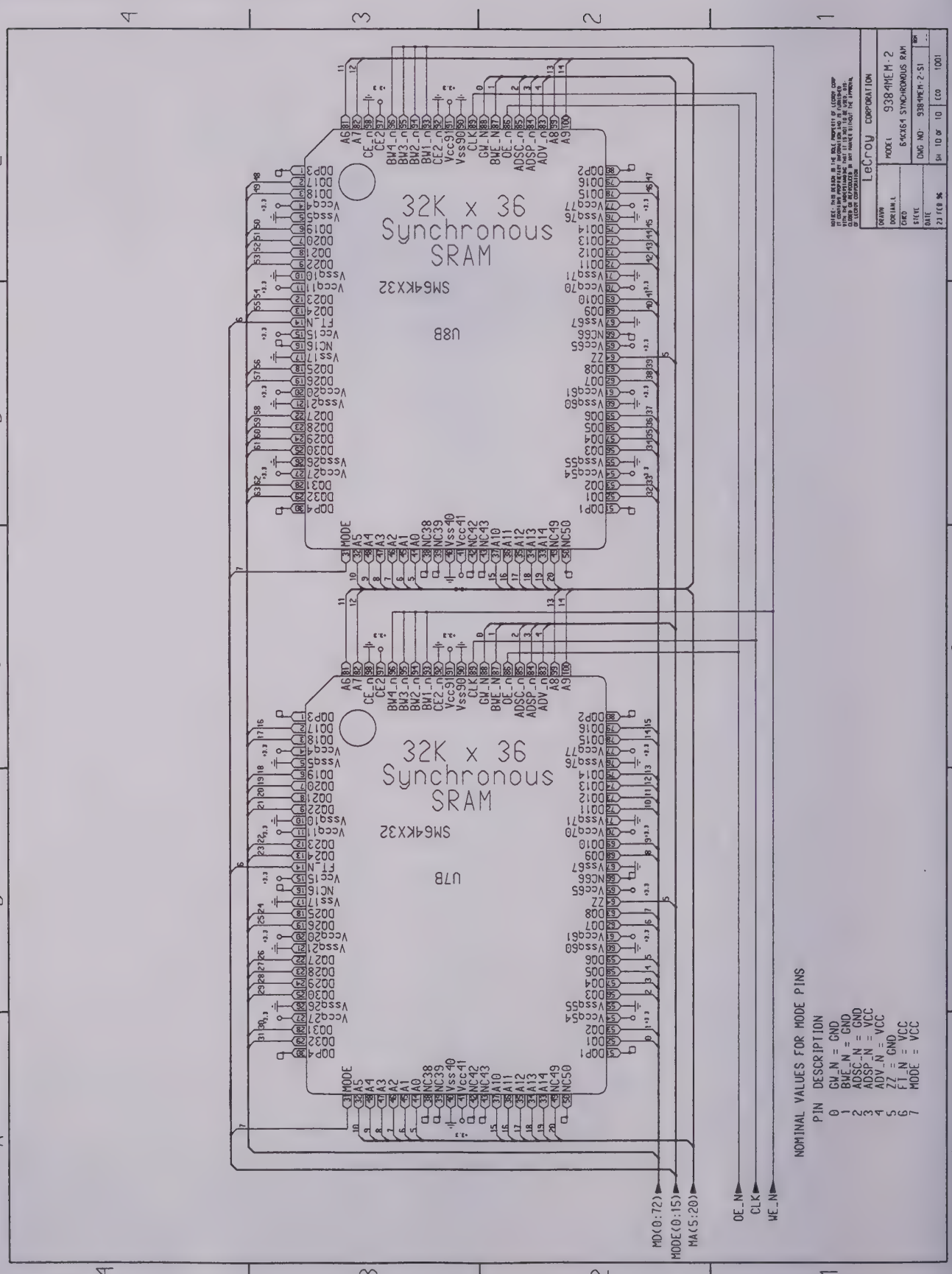
32K x 36
Synchronous
SRAM
SM64KX32
U6A
U5A
MODE
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL : 9384MEM-2
6-9X64 SYNCHRONOUS RAM
DRAWN
DORIAN.L
CHKD
STEVE
DATE
23 FEB 96
DWG NO: 9384MEM-2-S1
SH 5 OF 10
ECO : 1001


32K x 36
Synchronous
SRAM
SM64KX32
U8A
U7A
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL : 9384MEM-2
64Kx64 SYNCHRONOUS RAM
DWG NO: 9384MEM-2 ST
SH 6 OF 10
ECO 1001

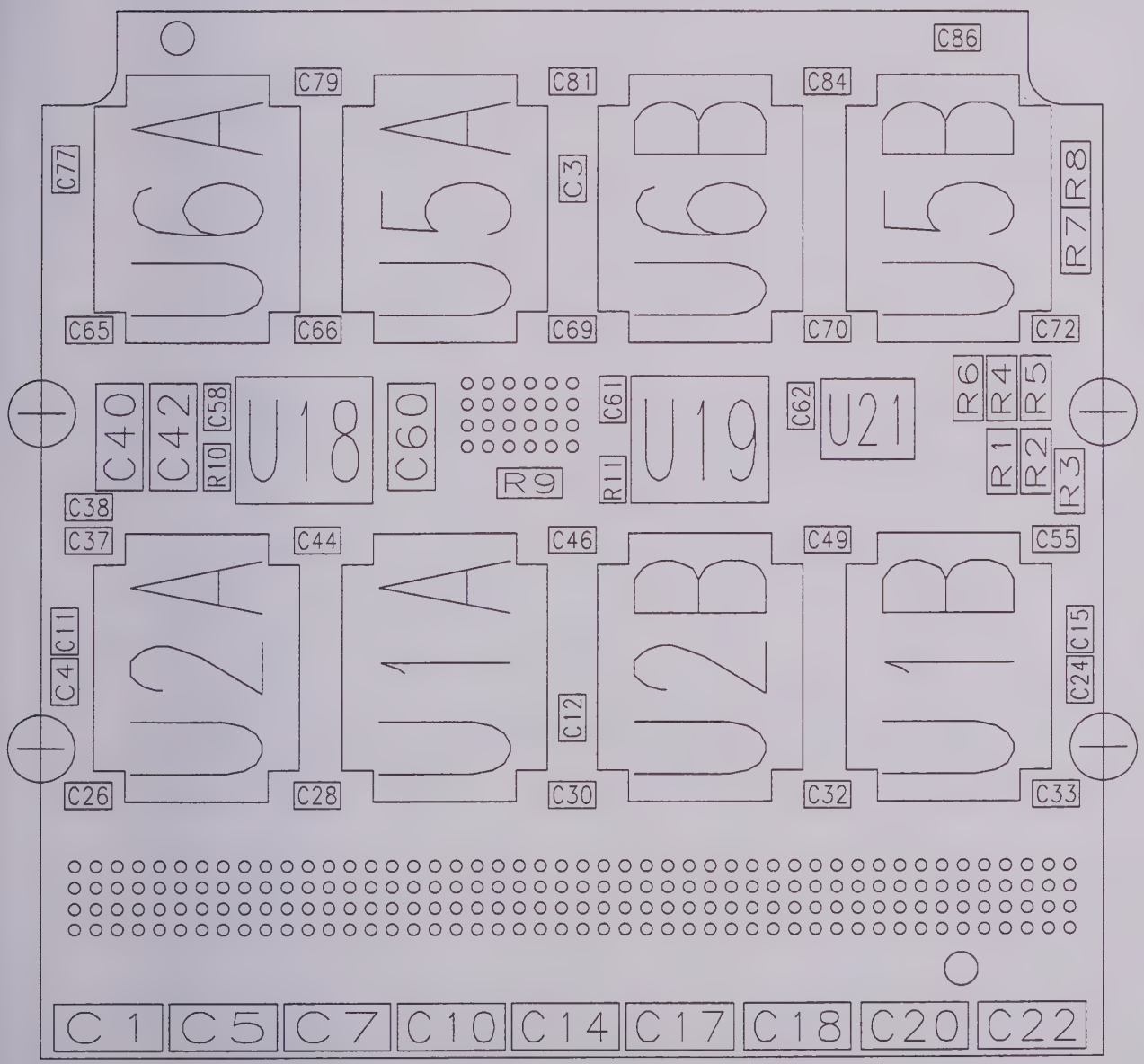

32K x 36
Synchronous
SRAM
SM64KX32
U28
32K x 36
Synchronous
SRAM
SM64KX32
U18
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
Lecroy CORPORATION
DRAWN
DORIAN.L
CHKD
STEVE
DATE
23 FEB 96
MODEL 9384MEM-2
64Kx64 SYNCHRONOUS RAM
DWG NO 9384MEM-2-SI
SH 7 OF 10
ECO : 1001


32K x 36
Synchronous
SRAM
SM64KX32
U48
U38
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSP_N = GND
3 ADSC_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384MEM-2
64Kx64 SYNCHRONOUS RAM
DWG NO 9384MEM-2-SI
SHT 8 OF 10
REV 1001

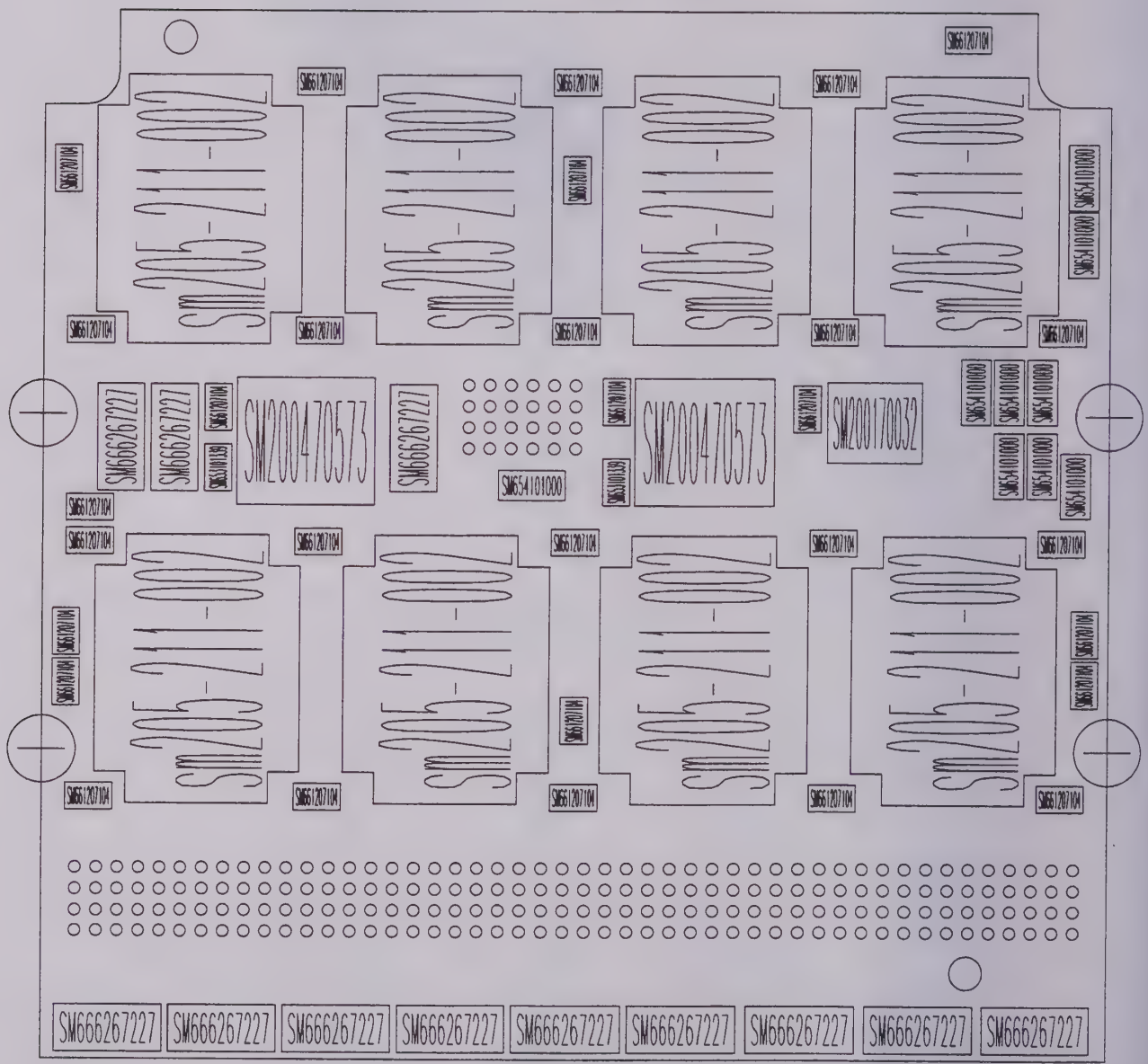

32K x 36
Synchronous
SRAM
SM64KX32
U6B
U5B
MODE
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 ADSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N
LeCroy CORPORATION
MODEL 9384MEM-2
64KX64 SYNCHRONOUS RAM
DWG NO 9384MEM-2-S1
SH 9 OF 10
ECO 1001


32K x 36
Synchronous
SRAM
SM64KX32
U8B
U7B
LeCroy CORPORATION
MODEL 9384MEM-2
64Kx64 SYNCHRONOUS RAM
DWG NO 9384MEM-2-S1
SH 10 OF 10
ECO 1001
NOMINAL VALUES FOR MODE PINS
PIN DESCRIPTION
0 GW_N = GND
1 BWE_N = GND
2 AOSC_N = GND
3 ADSP_N = VCC
4 ADV_N = VCC
5 ZZ = GND
6 FT_N = VCC
7 MODE = VCC
MD(0:72)
MODE(0:15)
MA(5:20)
OE_N
CLK
WE_N

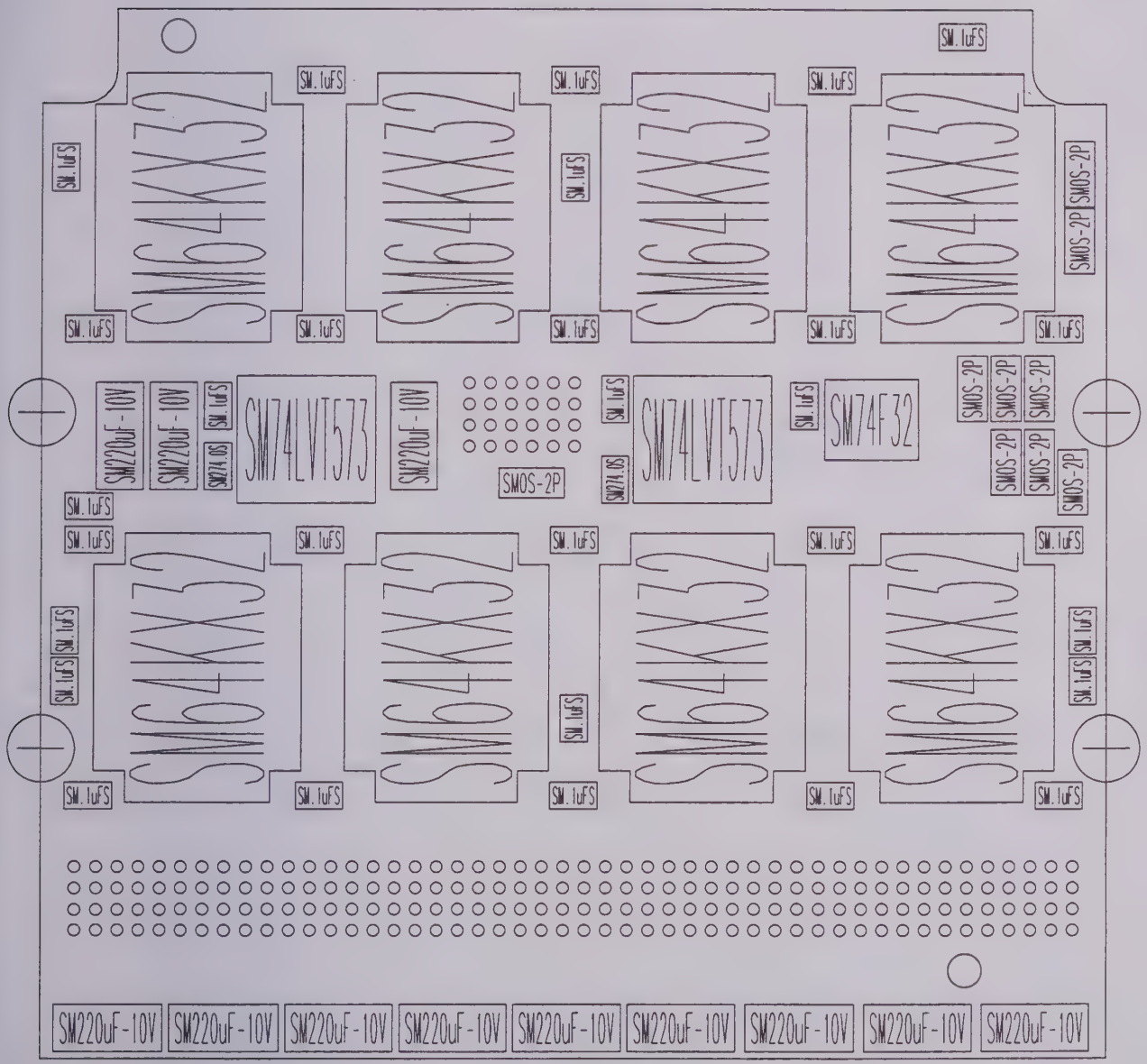
9384MEM-2 Rev B Side 1



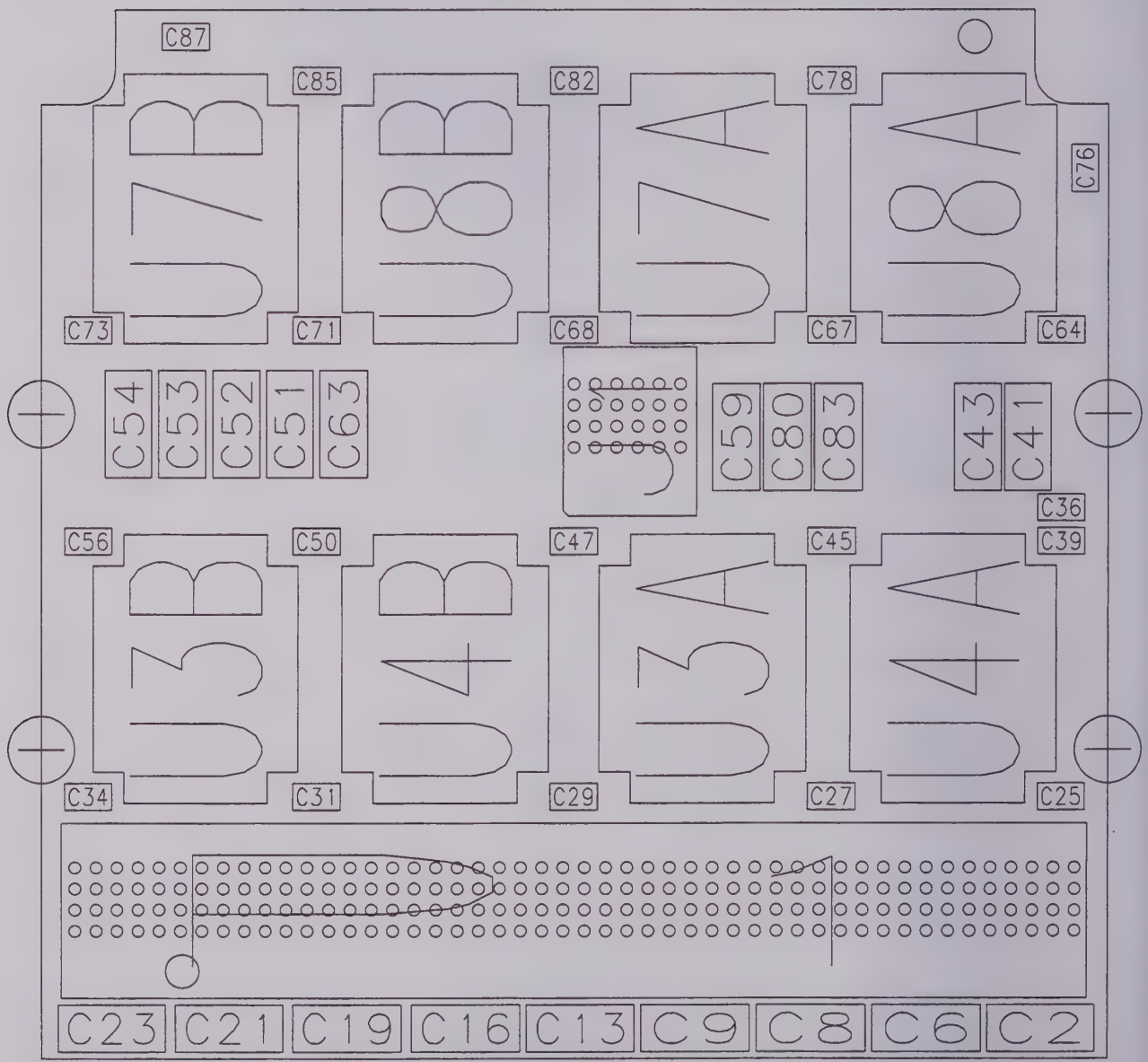
9384MEM-2 Rev B Side 1



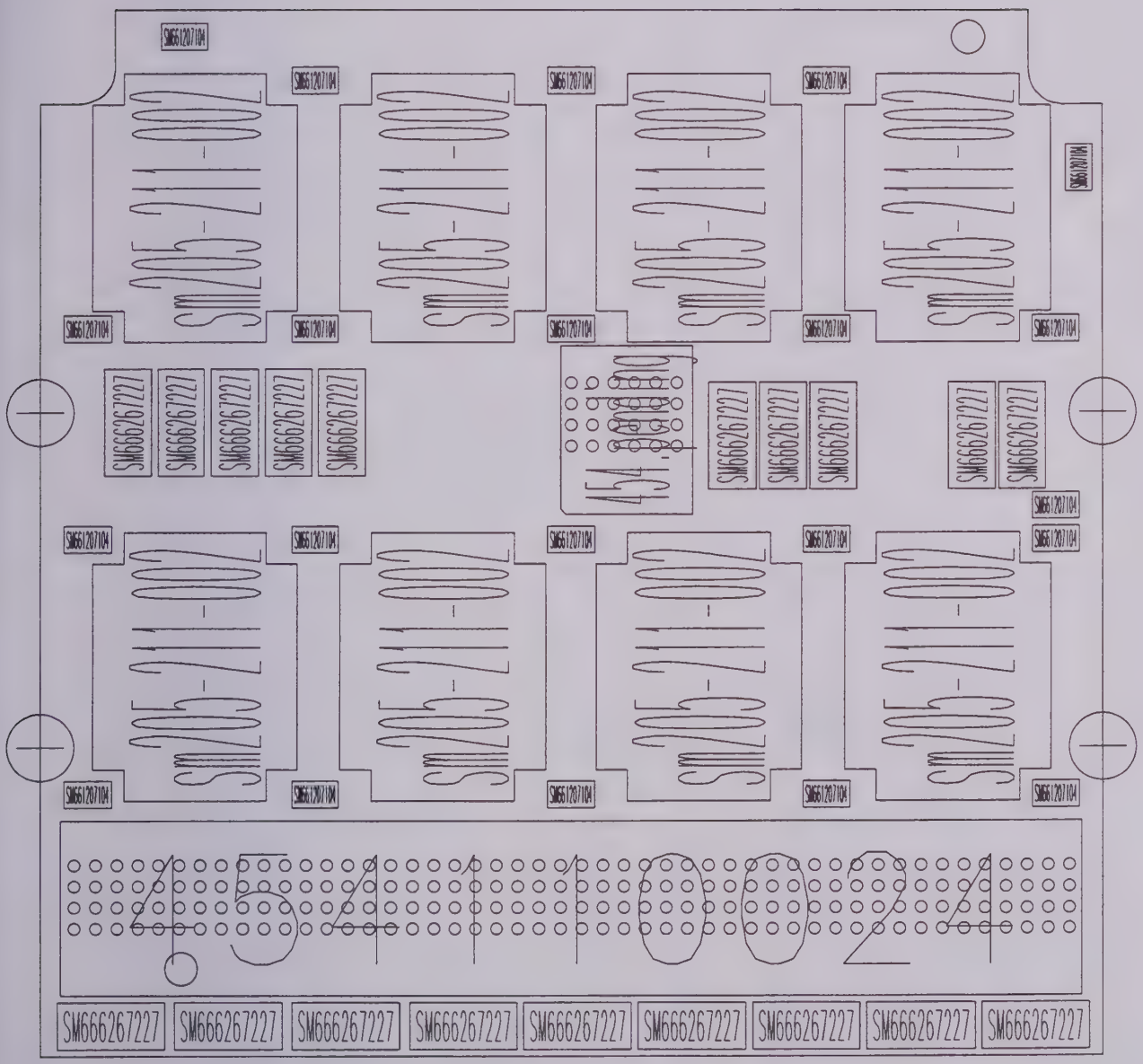
9384MEM-2 Rev B Side 1



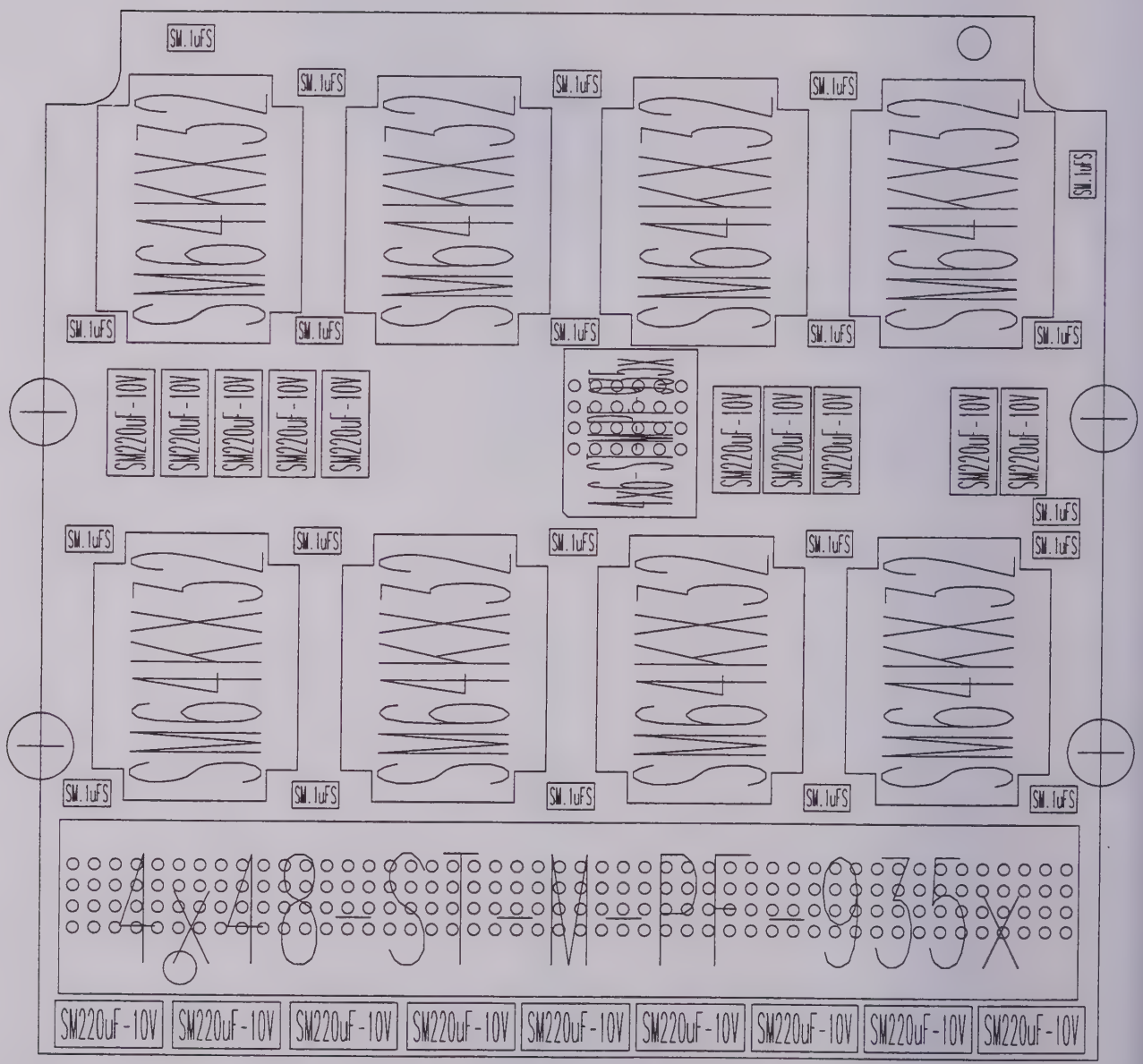
9384MEM-2 Rev B Side 2



9384MEM-2 Rev B Side 2



9384MEM-2 Rev B Side 2

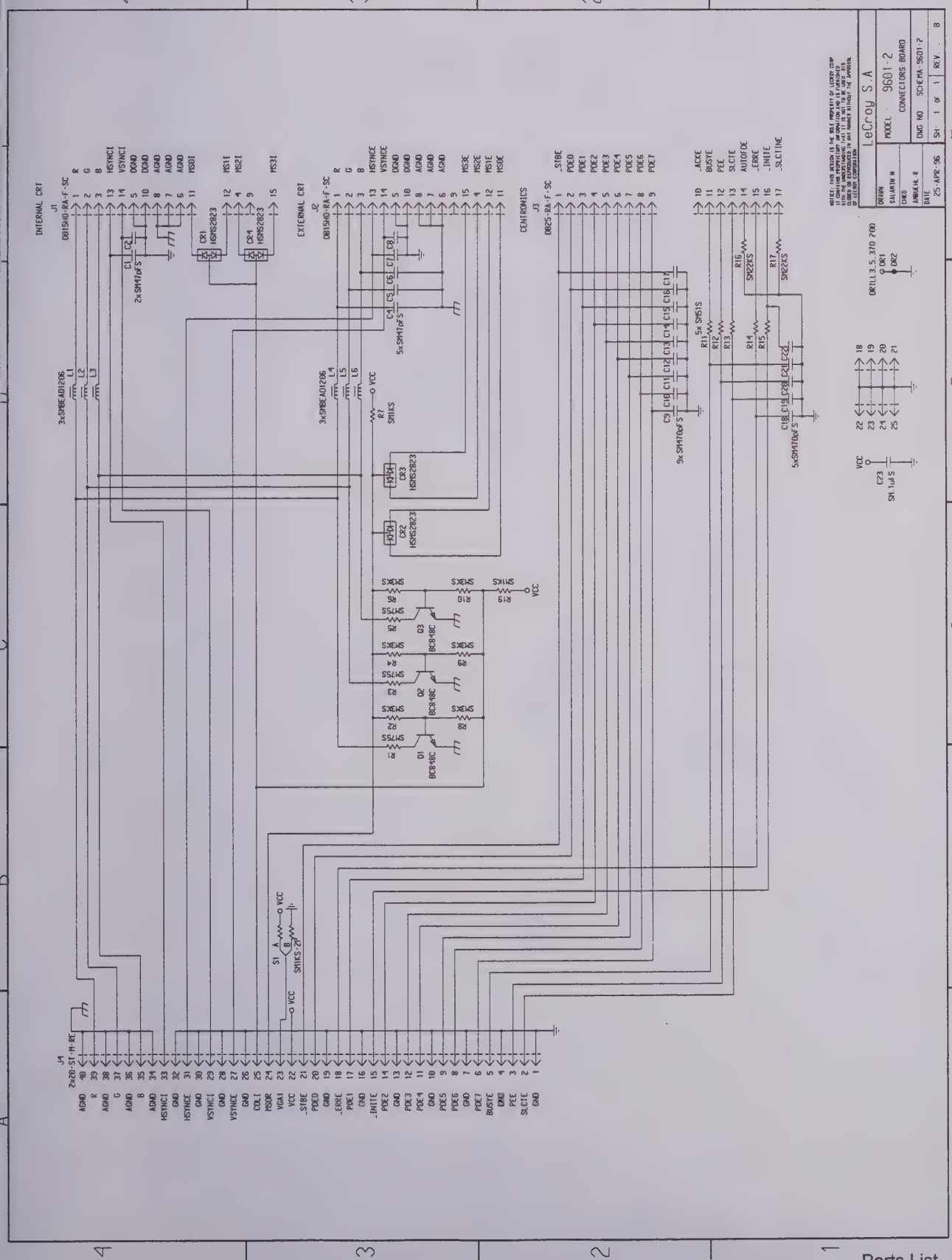


PART: 9384MEM-2 DESC : Acquisition Memory Card with 2 X 2M

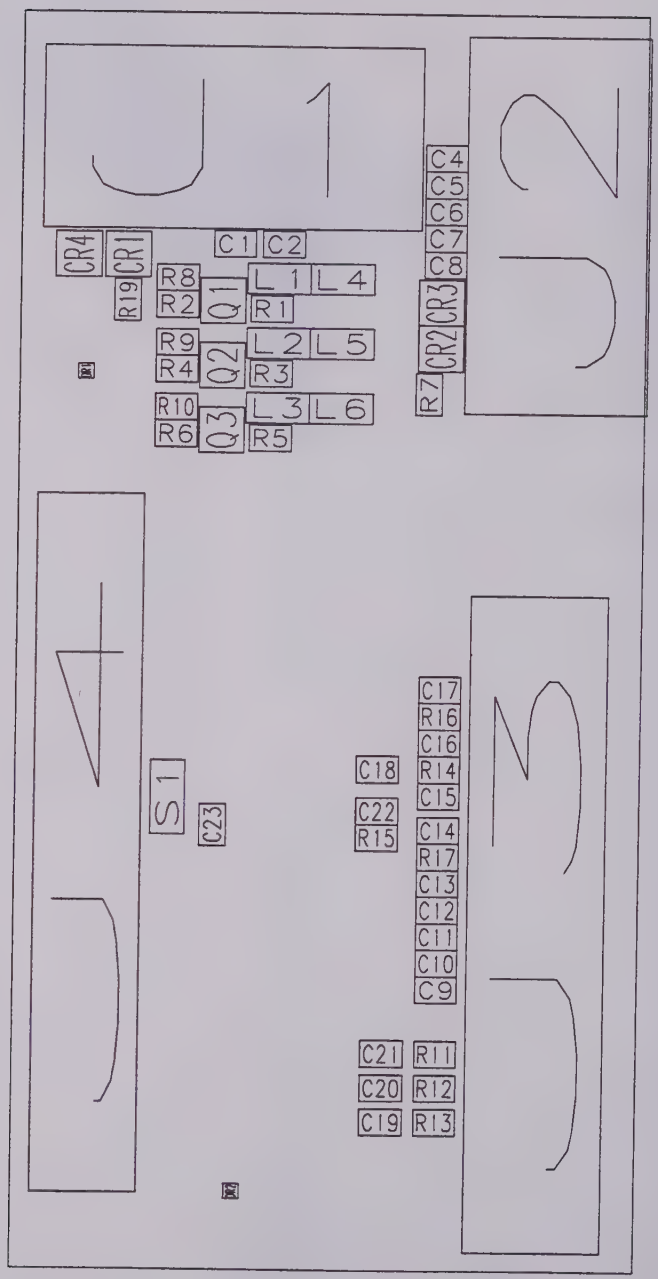
Location	Part Number	Description
C1	SM666267227	SM220uF-10V
C2	SM666267227	SM220uF-10V
C3	SM661207104	SM.1uFS
C4	SM661207104	SM.1uFS
C5	SM666267227	SM220uF-10V
C6	SM666267227	SM220uF-10V
C7	SM666267227	SM220uF-10V
C8	SM666267227	SM220uF-10V
C9	SM666267227	SM220uF-10V
C10	SM666267227	SM220uF-10V
C11	SM661207104	SM.1uFS
C12	SM661207104	SM.1uFS
C13	SM666267227	SM220uF-10V
C14	SM666267227	SM220uF-10V
C15	SM661207104	SM.1uFS
C16	SM666267227	SM220uF-10V
C17	SM666267227	SM220uF-10V
C18	SM666267227	SM220uF-10V
C19	SM666267227	SM220uF-10V
C20	SM666267227	SM220uF-10V
C21	SM666267227	SM220uF-10V
C22	SM666267227	SM220uF-10V
C23	SM666267227	SM220uF-10V
C24	SM661207104	SM.1uFS
C25	SM661207104	SM.1uFS
C26	SM661207104	SM.1uFS
C27	SM661207104	SM.1uFS
C28	SM661207104	SM.1uFS
C29	SM661207104	SM.1uFS
C30	SM661207104	SM.1uFS
C31	SM661207104	SM.1uFS
C32	SM661207104	SM.1uFS
C33	SM661207104	SM.1uFS
C34	SM661207104	SM.1uFS
C36	SM661207104	SM.1uFS
C37	SM661207104	SM.1uFS
C38	SM661207104	SM.1uFS
C39	SM661207104	SM.1uFS
C40	SM666267227	SM220uF-10V
C41	SM666267227	SM220uF-10V
C42	SM666267227	SM220uF-10V
C43	SM666267227	SM220uF-10V
C44	SM661207104	SM.1uFS
C45	SM661207104	SM.1uFS
C46	SM661207104	SM.1uFS
C47	SM661207104	SM.1uFS
C49	SM661207104	SM.1uFS
C50	SM661207104	SM.1uFS
C51	SM666267227	SM220uF-10V
C52	SM666267227	SM220uF-10V
C53	SM666267227	SM220uF-10V
C54	SM666267227	SM220uF-10V
C55	SM661207104	SM.1uFS
C56	SM661207104	SM.1uFS
C58	SM661207104	SM.1uFS
C59	SM666267227	SM220uF-10V
C60	SM666267227	SM220uF-10V
C61	SM661207104	SM.1uFS
C62	SM661207104	SM.1uFS
C63	SM666267227	SM220uF-10V
C64	SM661207104	SM.1uFS
C65	SM661207104	SM.1uFS
C66	SM661207104	SM.1uFS
C67	SM661207104	SM.1uFS
C68	SM661207104	SM.1uFS
C69	SM661207104	SM.1uFS
C70	SM661207104	SM.1uFS
C71	SM661207104	SM.1uFS
C72	SM661207104	SM.1uFS
C73	SM661207104	SM.1uFS
C76	SM661207104	SM.1uFS
C77	SM661207104	SM.1uFS
C78	SM661207104	SM.1uFS
C79	SM661207104	SM.1uFS
C80	SM666267227	SM220uF-10V
C81	SM661207104	SM.1uFS
C82	SM661207104	SM.1uFS
C83	SM666267227	SM220uF-10V
C84	SM661207104	SM.1uFS
C85	SM661207104	SM.1uFS
C86	SM661207104	SM.1uFS
C87	SM661207104	SM.1uFS
J1	454110024	4x6-ST-M-PF-935x
P1	454110024	4x6-ST-M-PF-935x
R1	SM654101000	SM0S-2P
R2	SM654101000	SM0S-2P
R3	SM654101000	SM0S-2P
R4	SM654101000	SM0S-2P

PART: 9384MEM-2 **DESC : Acquisiton Memory Card with 2 X 2M**

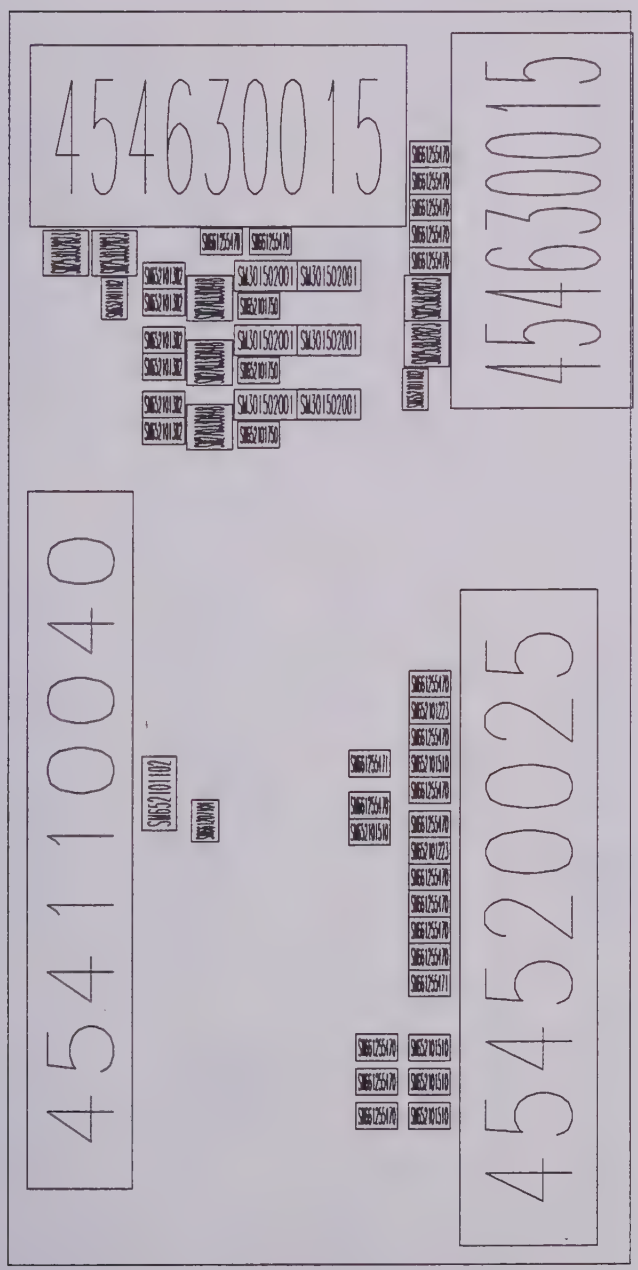
Location	Part Number	Description
R5	SM654101000	SM0S-2P
R6	SM654101000	SM0S-2P
R7	SM654101000	SM0S-2P
R8	SM654101000	SM0S-2P
R9	SM654101000	SM0S-2P
R10	SM653101339	SM274.0S
R11	SM653101339	SM274.0S
U18	SM200470573	SM74LVT573
U19	SM200470573	SM74LVT573
U1A	sm205-211-002	SM64KX32
U1B	sm205-211-002	SM64KX32
U21	SM200170032	SM74F32
U2A	sm205-211-002	SM64KX32
U2B	sm205-211-002	SM64KX32
U3A	sm205-211-002	SM64KX32
U3B	sm205-211-002	SM64KX32
U4A	sm205-211-002	SM64KX32
U4B	sm205-211-002	SM64KX32
U5A	sm205-211-002	SM64KX32
U5B	sm205-211-002	SM64KX32
U6A	sm205-211-002	SM64KX32
U6B	sm205-211-002	SM64KX32
U7A	sm205-211-002	SM64KX32
U7B	sm205-211-002	SM64KX32
U8A	sm205-211-002	SM64KX32
U8B	sm205-211-002	SM64KX32


INTERNAL CRT
EXTERNAL CRT
CENTRONICS
LeCroy S.A
MODEL 9601-2
CONNECTORS BOARD
SCHEMA 9601-2
25-APR-96

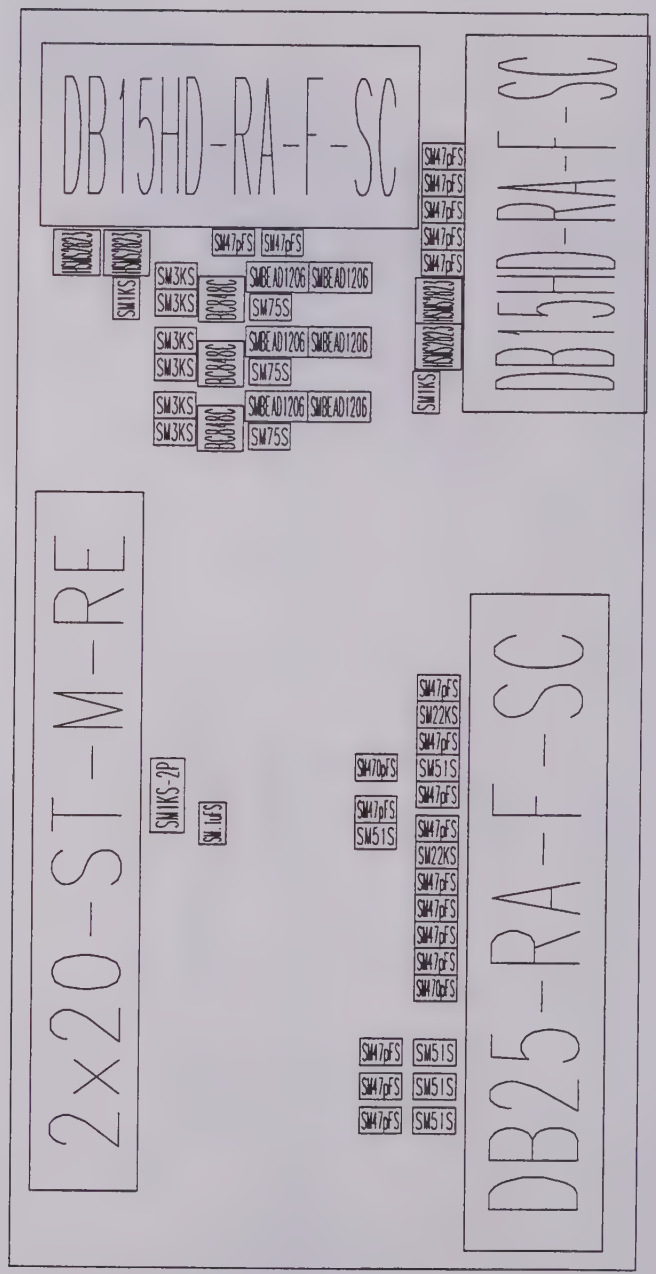
F9601-2 Rev B


J1
J2
J4
J3
C4
C5
C6
C7
C8
CR4
CR1
C1
C2
R8
R2
Q1
L1
L4
R19
R1
CR3
CR2
R9
R4
Q2
L2
L5
R3
R7
R10
R6
Q3
L3
L6
R5
C17
R16
C16
R14
C15
S1
C18
C22
R15
C14
R17
C13
C12
C11
C10
C9
C23
C21
R11
C20
R12
C19
R13

F9601-2 Rev B

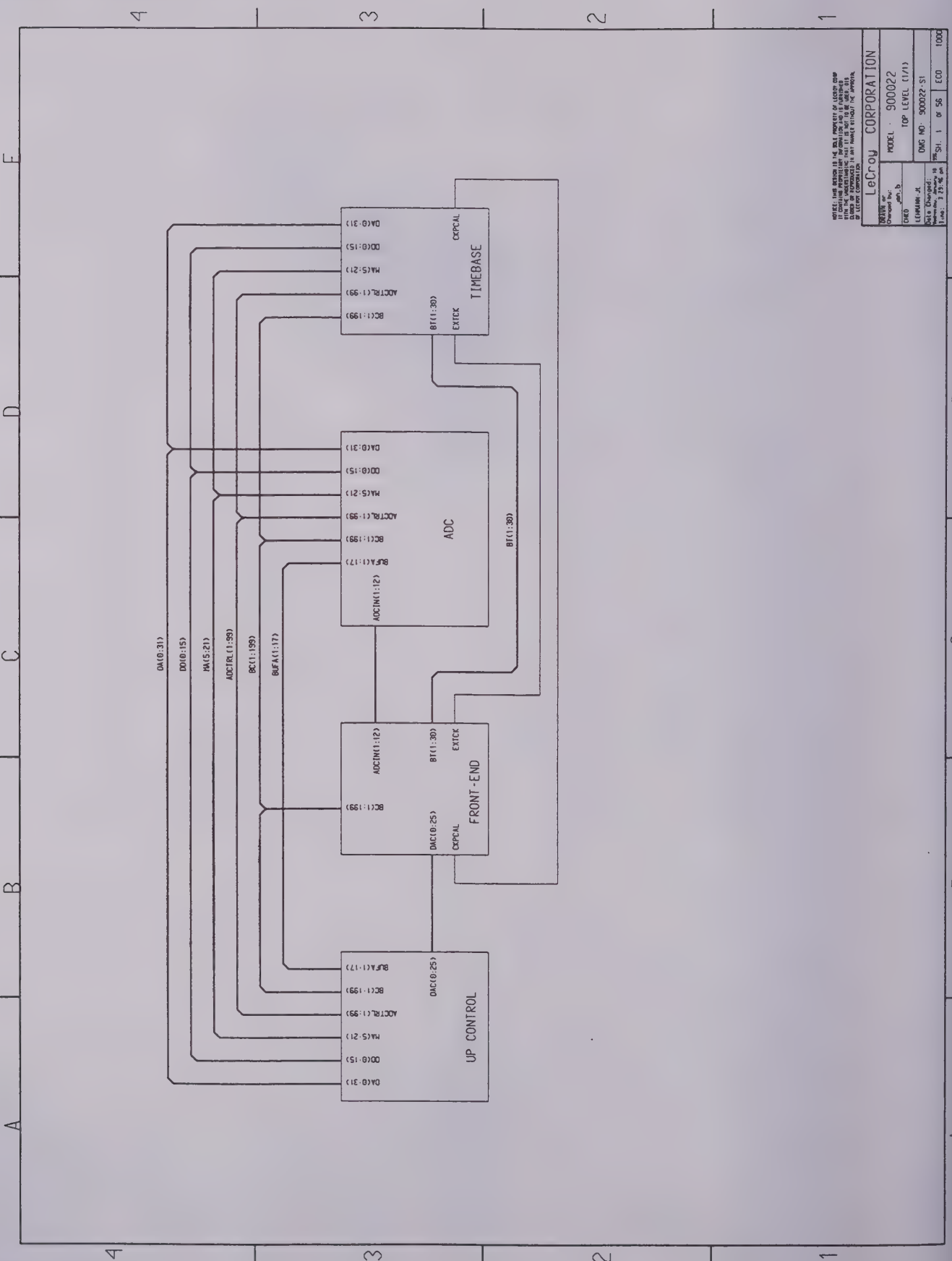


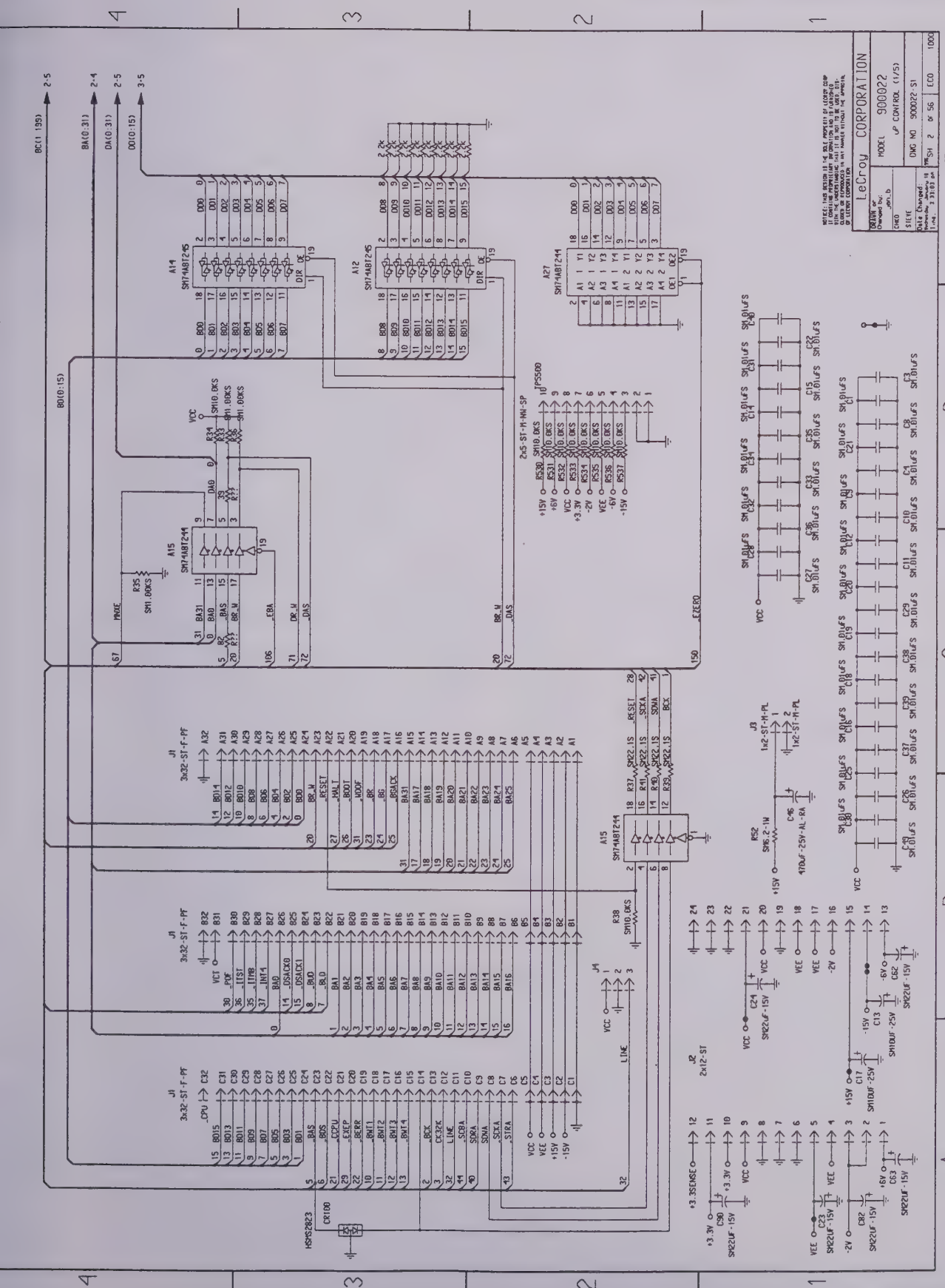
F9601-2 Rev B

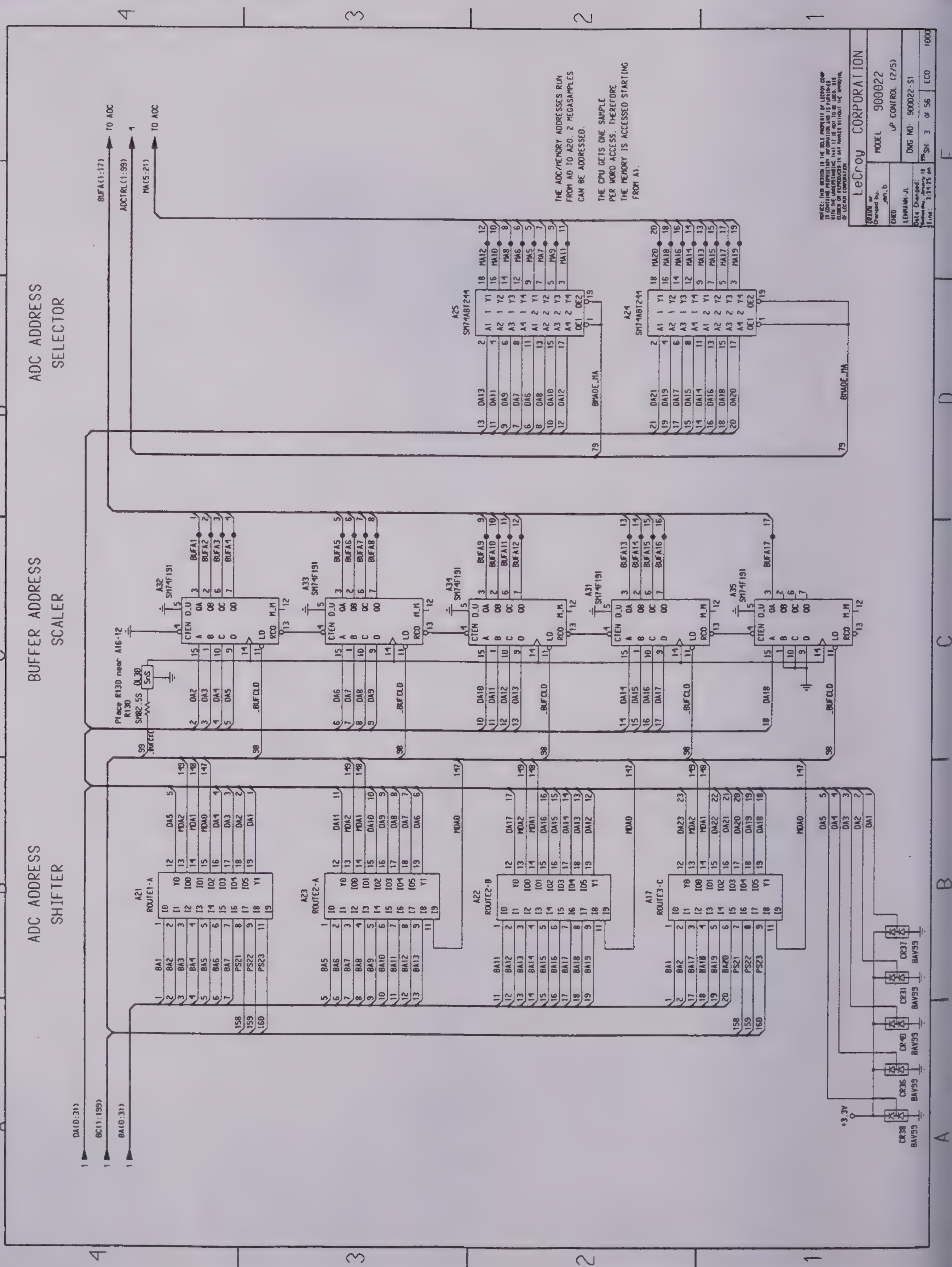

DB15HD-RA-F-SC
DB15HD-RA-F-SC
2x20-ST-M-RE
DB25-RA-F-SC
SM47pFS
SM3KS
SM75S
SMBEAD1206
SM1KS
SM1KS-2P
SM22KS
SM51S
SM70pFS

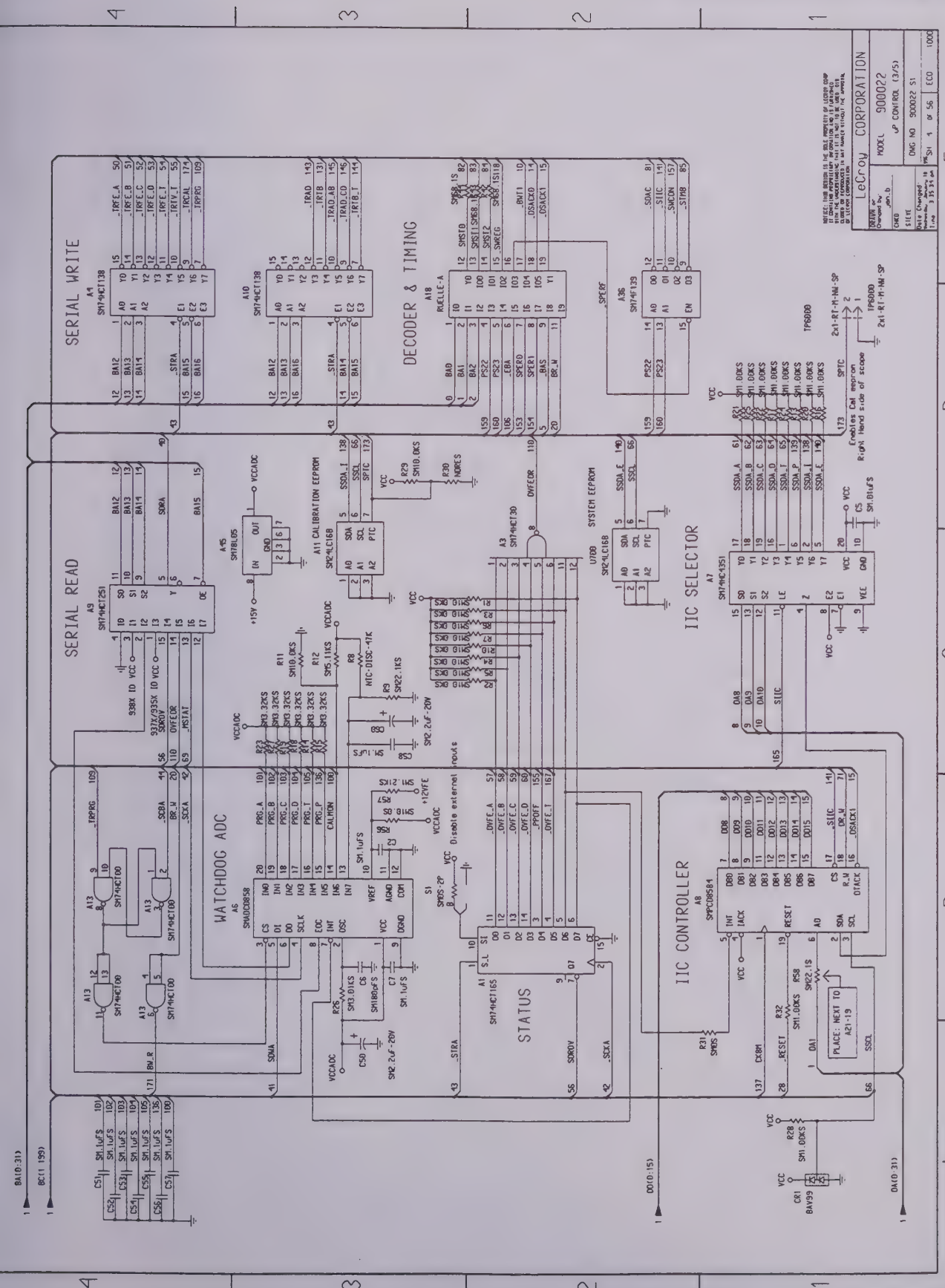
PART: F9601-2 **DESC : Centronics & VGA Interface**

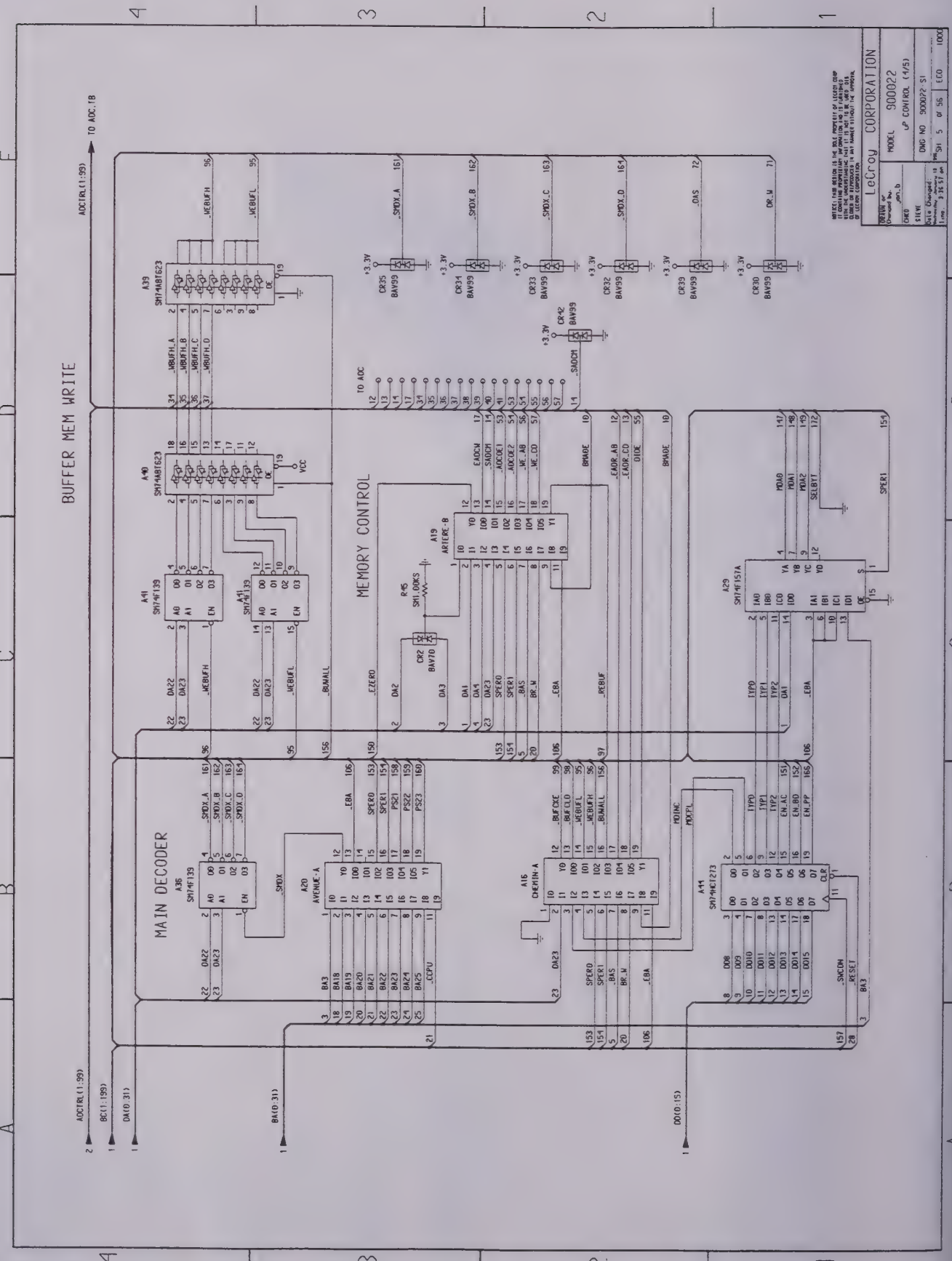
Location	Part Number	Description	Location	Part Number	Description
C1	SM661255470	SM47pFS	J4	454110040	2x20-ST-M-RE
C2	SM661255470	SM47pFS	L1	SM301502001	SMBEAD1206
C4	SM661255470	SM47pFS	L2	SM301502001	SMBEAD1206
C5	SM661255470	SM47pFS	L3	SM301502001	SMBEAD1206
C6	SM661255470	SM47pFS	L4	SM301502001	SMBEAD1206
C7	SM661255470	SM47pFS	L5	SM301502001	SMBEAD1206
C8	SM661255470	SM47pFS	L6	SM301502001	SMBEAD1206
C9	SM661255471	SM470pFS	Q1	SM270330848	BC848C
C10	SM661255470	SM47pFS	Q2	SM270330848	BC848C
C11	SM661255470	SM47pFS	Q3	SM270330848	BC848C
C12	SM661255470	SM47pFS	R1	SM652101750	SM75S
C13	SM661255470	SM47pFS	R2	SM652101302	SM3KS
C14	SM661255470	SM47pFS	R3	SM652101750	SM75S
C15	SM661255470	SM47pFS	R4	SM652101302	SM3KS
C16	SM661255470	SM47pFS	R5	SM652101750	SM75S
C17	SM661255470	SM47pFS	R6	SM652101302	SM3KS
C18	SM661255471	SM470pFS	R7	SM652101102	SM1KS
C19	SM661255470	SM47pFS	R8	SM652101302	SM3KS
C20	SM661255470	SM47pFS	R9	SM652101302	SM3KS
C21	SM661255470	SM47pFS	R10	SM652101302	SM3KS
C22	SM661255470	SM47pFS	R11	SM652101510	SM51S
C23	SM661207104	SM.1uFS	R12	SM652101510	SM51S
CR1	SM253032823	HSMS2823	R13	SM652101510	SM51S
CR2	SM253032823	HSMS2823	R14	SM652101510	SM51S
CR3	SM253032823	HSMS2823	R15	SM652101510	SM51S
CR4	SM253032823	HSMS2823	R16	SM652101223	SM22KS
J1	454630015	DB15HD-	R17	SM652101223	SM22KS
J2	454630015	DB15HD	R19	SM652101102	SM1KS
J3	454520025	DB25-RA	S1	SM652101102	SM1KS-2P

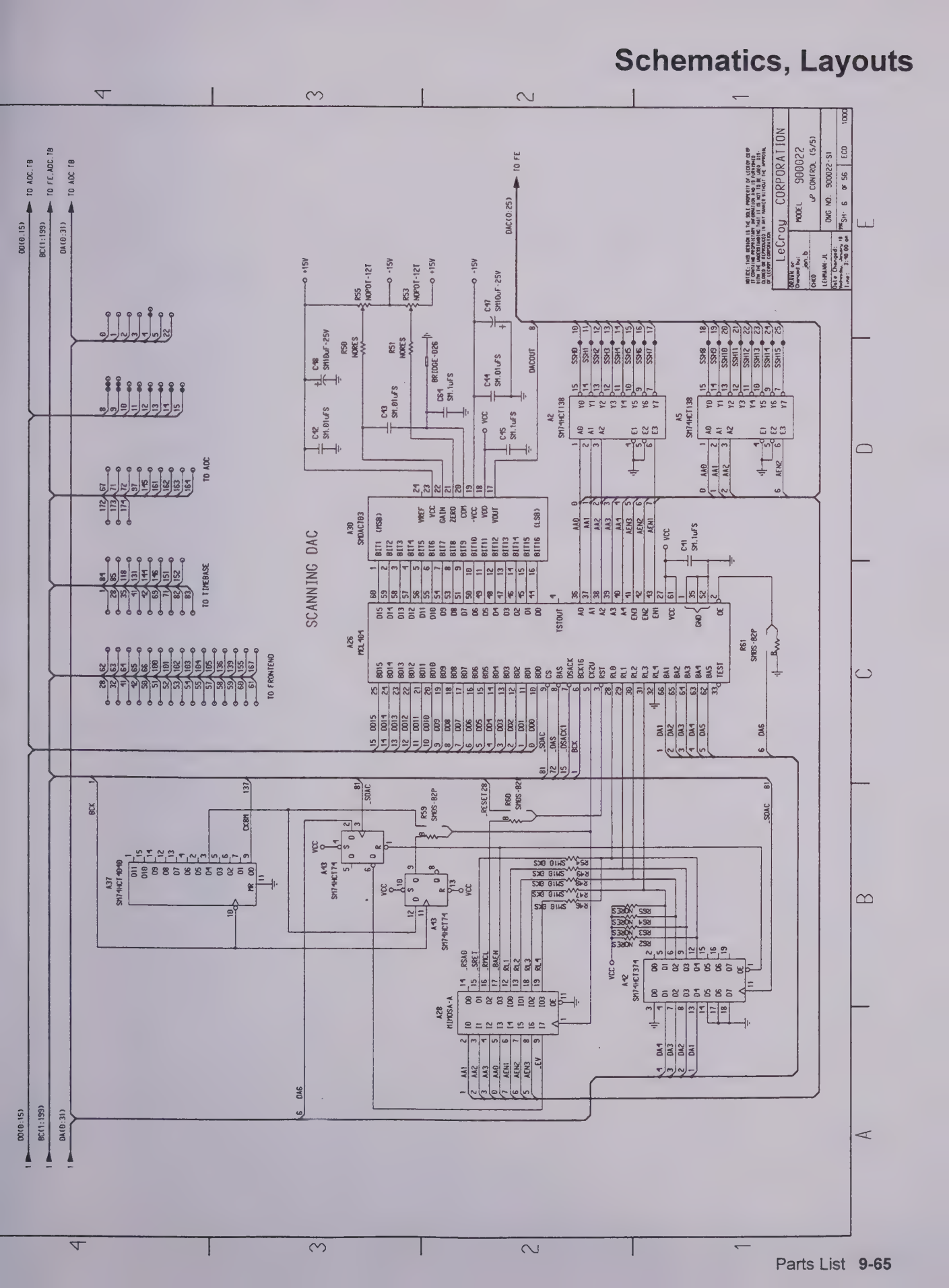

TIMEBASE
ADC
FRONT-END
UP CONTROL
DA(0:31)
DD(0:15)
MA(5:21)
ADCTRL(1:99)
BC(1:199)
BUFA(1:17)
ADCIN(1:12)
BT(1:30)
EXTCK
CKPCAL
DAC(0:25)
LeCroy CORPORATION
MODEL 900022
TOP LEVEL (1/1)
DWG NO: 900022-S1
SH: 1 OF 56
ECO


LeCroy CORPORATION
MODEL 900022
µP CONTROL (1/5)
DWG NO 900022-S1
SH 2 OF 56
ECO 1000
A14 SN74ABT245
A12 SN74ABT245
A27 SN74ABT244
A15 SN74ABT244
J1 3x32-ST-F-PF
J2 2x12-ST
J3 1x2-ST-M-PL
J4
TP5500
2x5-ST-M-NW-SP
HSMS2823
CR100

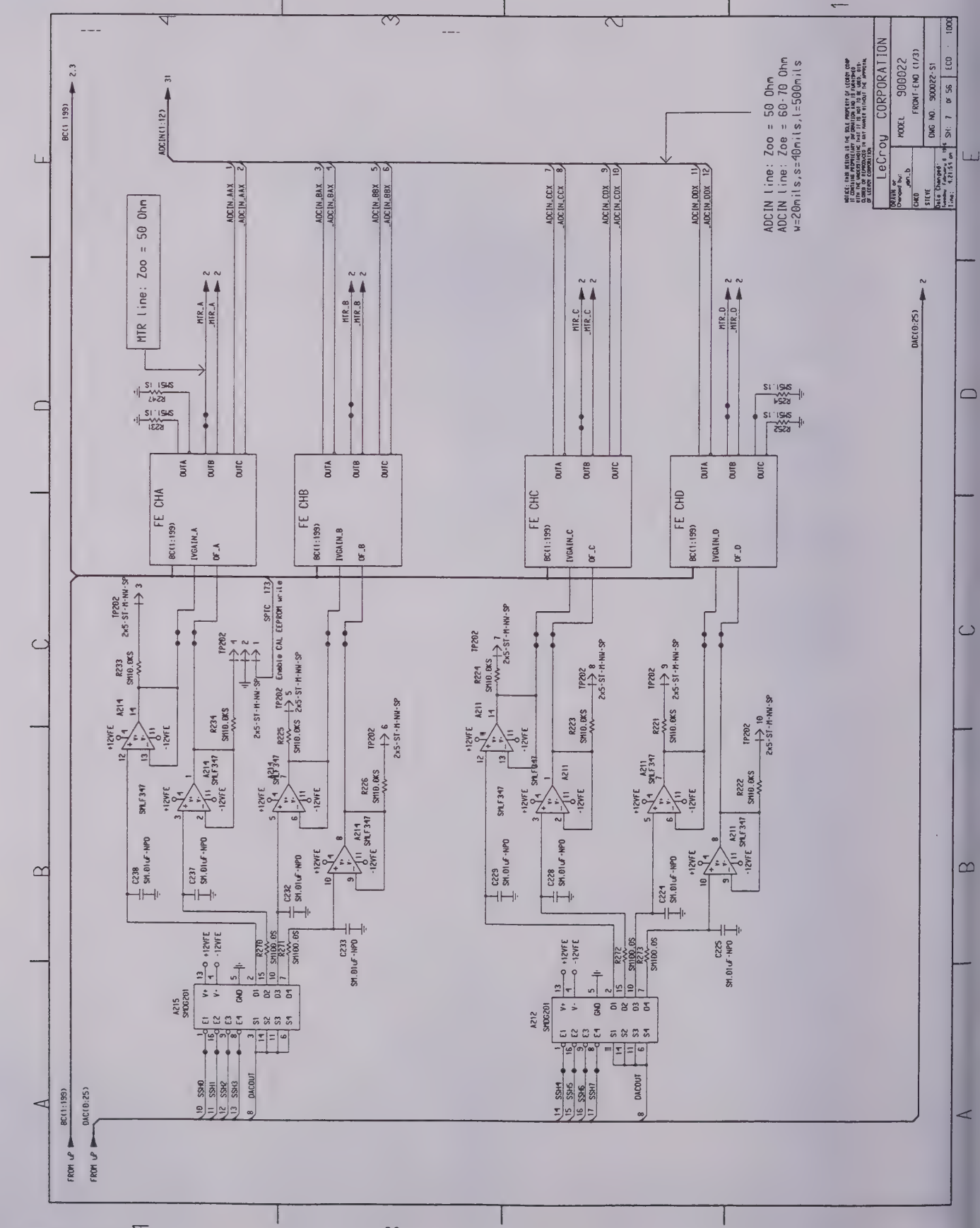

ADC ADDRESS SHIFTER
BUFFER ADDRESS SCALER
ADC ADDRESS SELECTOR
THE ADC/MEMORY ADDRESSES RUN FROM A0 TO A20. 2 MEGASAMPLES CAN BE ADDRESSED.
THE CPU GETS ONE SAMPLE PER WORD ACCESS. THEREFORE THE MEMORY IS ACCESSED STARTING FROM A1.
LeCroy CORPORATION
MODEL 900022
µP CONTROL (2/5)
DWG NO: 900022-S1
SH 3 OF 56

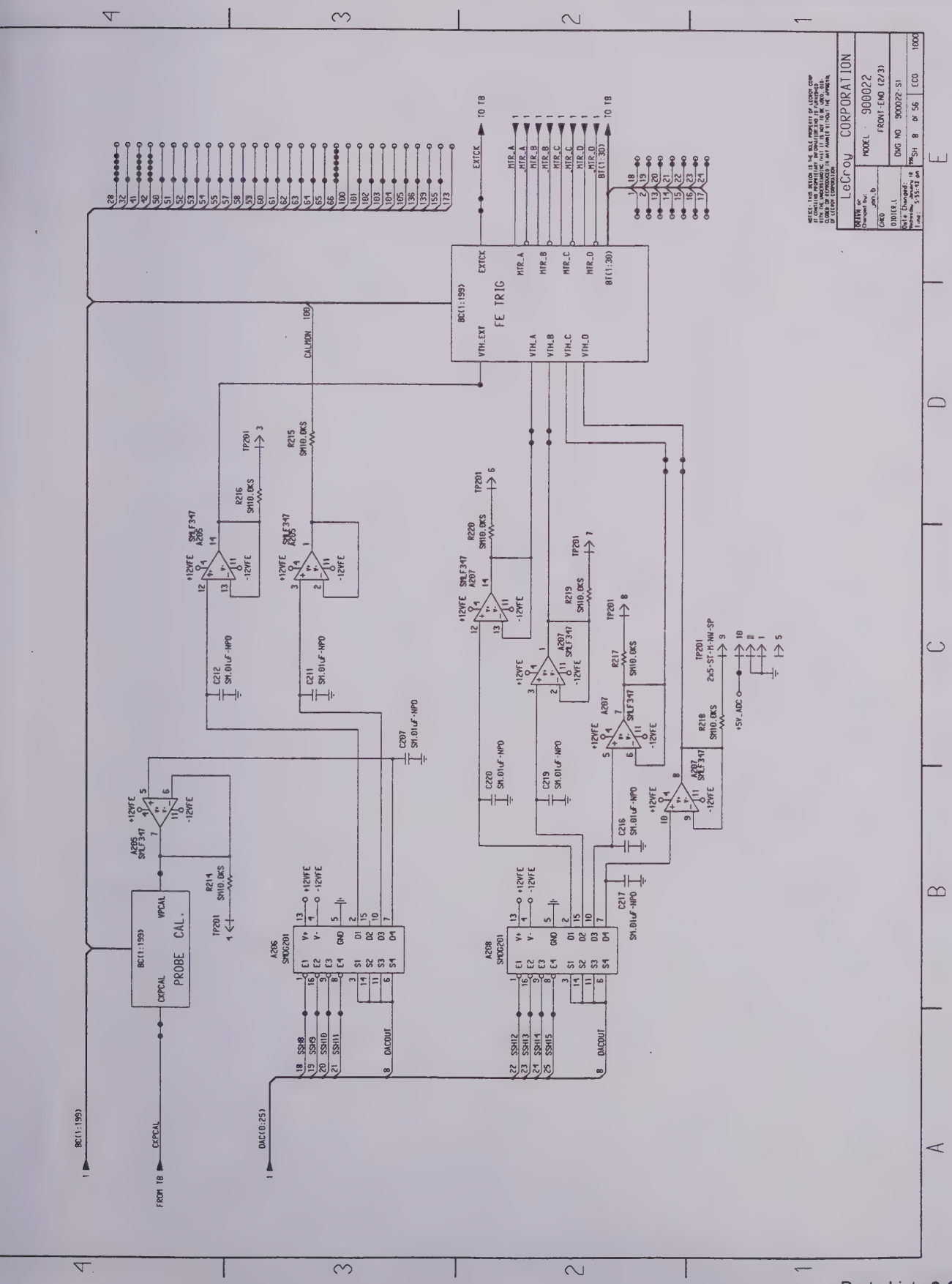

SERIAL WRITE
DECODER & TIMING
SERIAL READ
IIC SELECTOR
WATCHDOG ADC
STATUS
IIC CONTROLLER
LeCroy CORPORATION
MODEL 900022
uP CONTROL (3/5)
DWG NO 900022 S1
SH 4 OF 56
ECO 1000

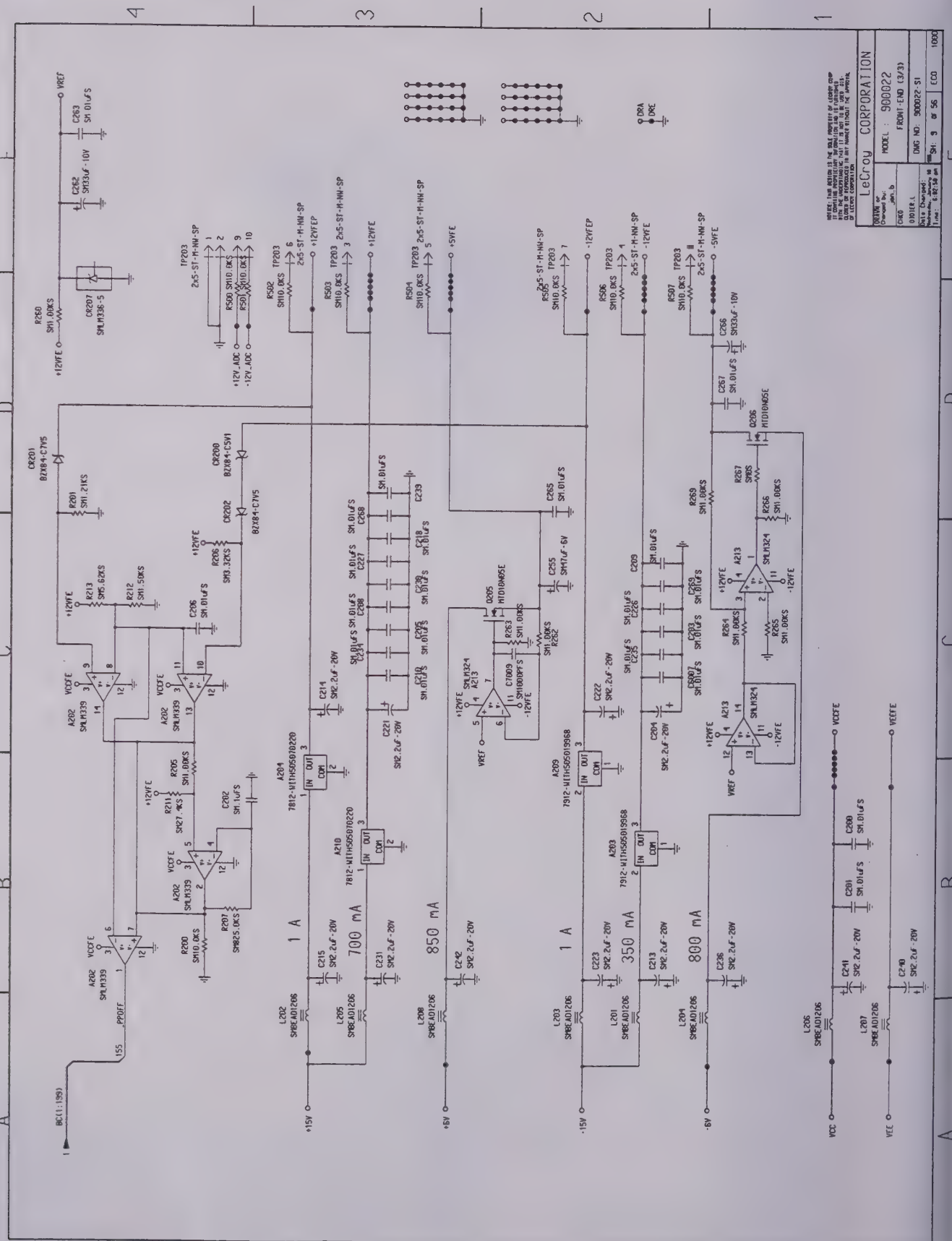

BUFFER MEM WRITE
MEMORY CONTROL
MAIN DECODER
LeCroy CORPORATION
MODEL 900022
uP CONTROL (4/5)
DWG NO 900022-S1
SH 5 OF 56
ECO 1000

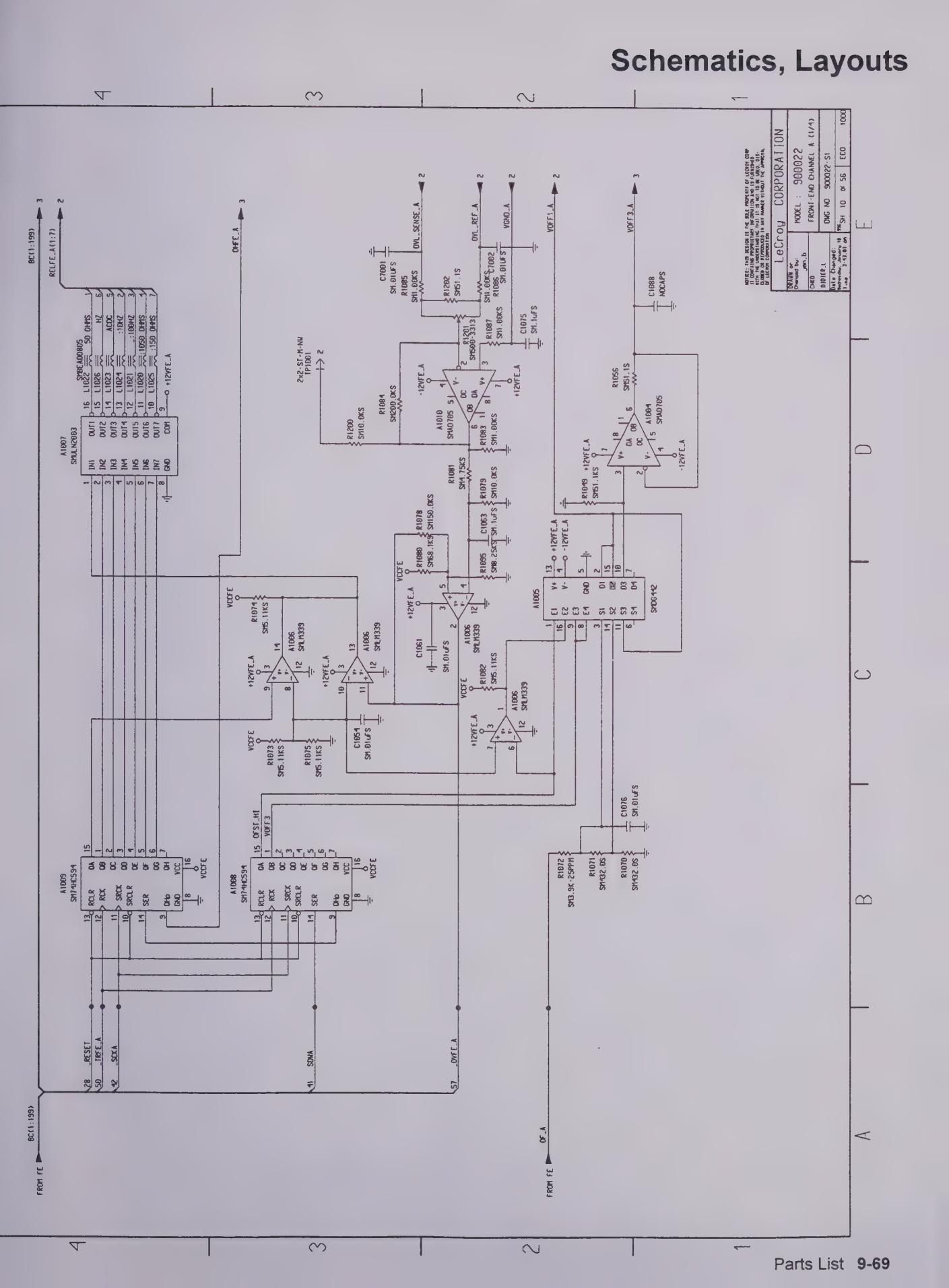

SCANNING DAC
LeCroy CORPORATION
MODEL 900022
μP CONTROL (5/5)
DWG NO 900022-SI
SH 6 OF 56
ECO 1000
TO ADC.TB
TO FE.ADC.TB
TO ADC FB
TO ADC
TO TIMEBASE
TO FRONTEND
TO FE
DO(0:15)
BC(1:199)
DA(0:31)
DAC(0:25)
A26 MCL-401
A30 SMDAC703
A2 SN74HCT138
A5 SN74HCT138
A37 SN74HCT4040
A43 SN74HCT74
A28 MIMOSA-A
A42 SN74HCT374
A1 SN74HCT374
RS1 SMDS-82P
RS5 NOPOT-12T
RS3 NOPOT-12T
RS0 NORES
RS1 NORES
C46 SM10uF-25V
C47 SM10uF-25V
C42 SM.01uFS
C43 SM.01uFS
C44 SM.01uFS
C45 SM.1uFS
C41 SM.1uFS
DS1 BRIDGE-026
+15V
-15V
VCC
BCK
_SDAC
_RESET28
_SRE1
_RPCL
_BAEN
_CV
DA0
DA1
DA2
DA3
DA4
DA5
DA6

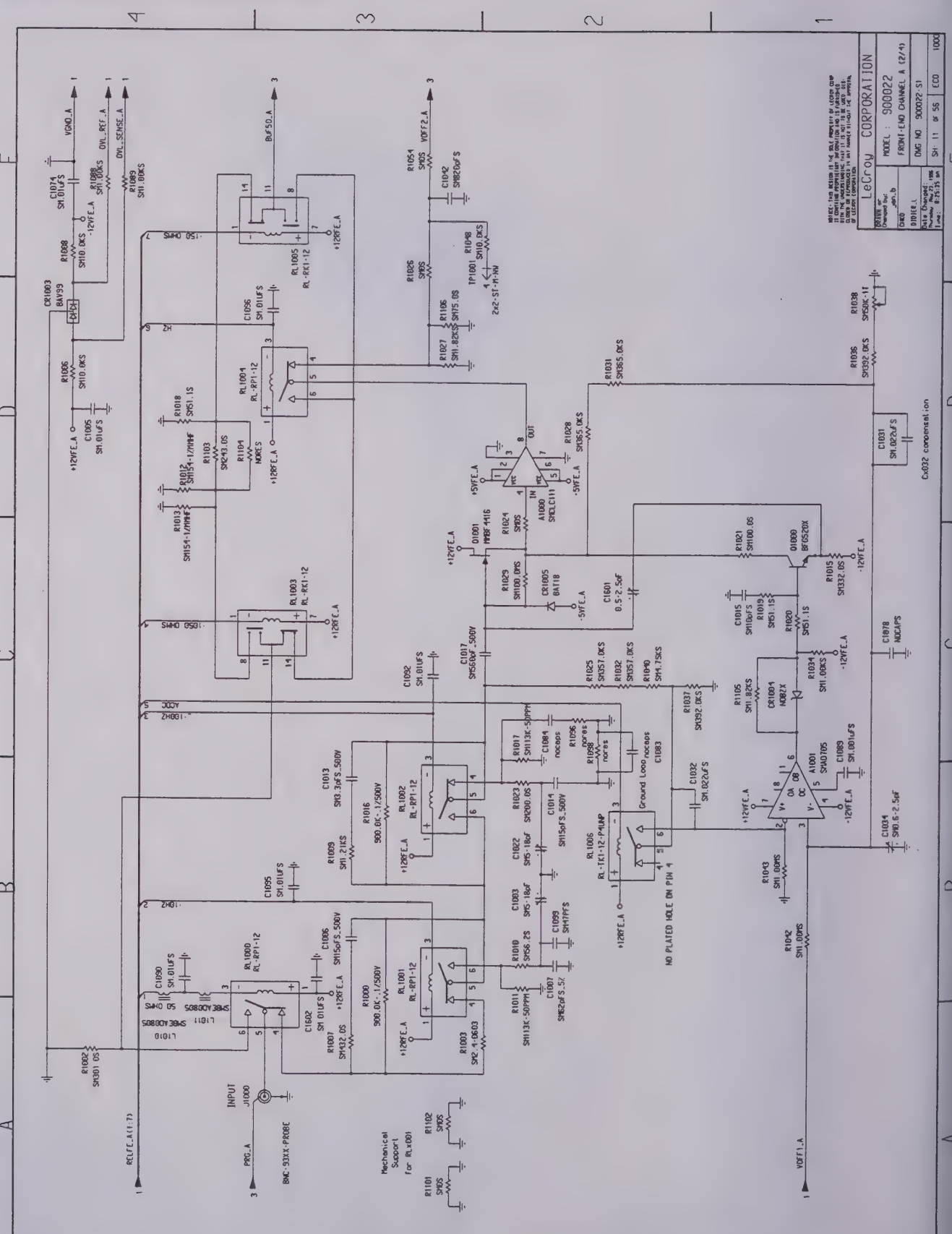
Schematics, Layouts

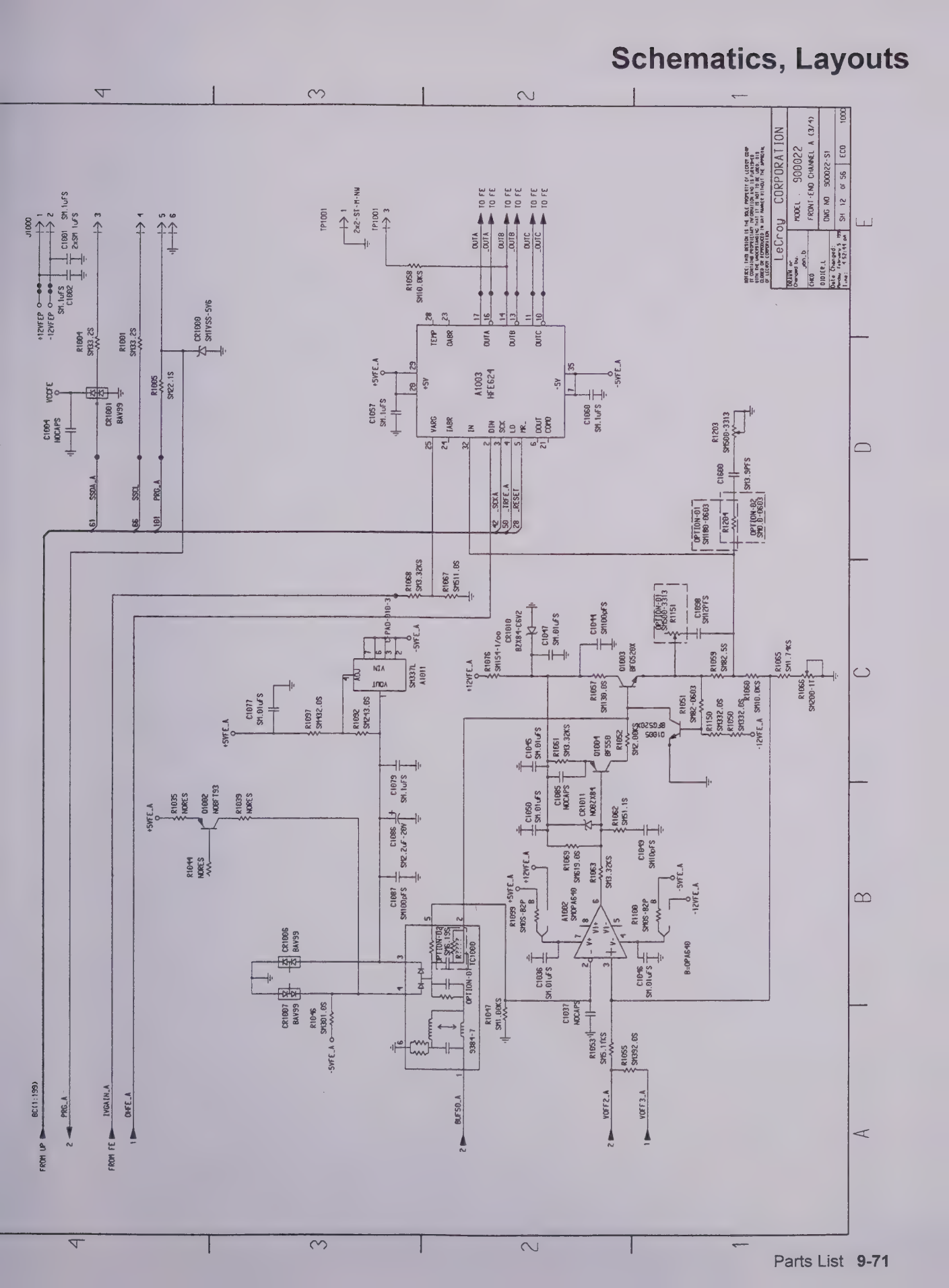



LeCroy CORPORATION
MODEL 900022
FRONT-END (2/3)
DWG NO 900022-S1
SH 8 OF 56
ECO 1000
FE TRIG
PROBE CAL.
BC(1:199)
CKPCAL
VPCAL
FROM TB
DAC(0:25)
DACOUT
CALMON
EXTCK
TO TB
MTR_A
MTR_B
MTR_C
MTR_D
BT(1:30)
VTH_EXT
VTH_A
VTH_B
VTH_C
VTH_D
+5V_ADC
A205
A206
A207
A208
SMLF347
SMDG201
TP201
R214
R215
R216
R217
R218
R219
R220
C207
C211
C212
C216
C217
C219
C220
SM.01uF-NPO
SM10.0KS
2x5-ST-M-NW-SP
+12VFE
-12VFE

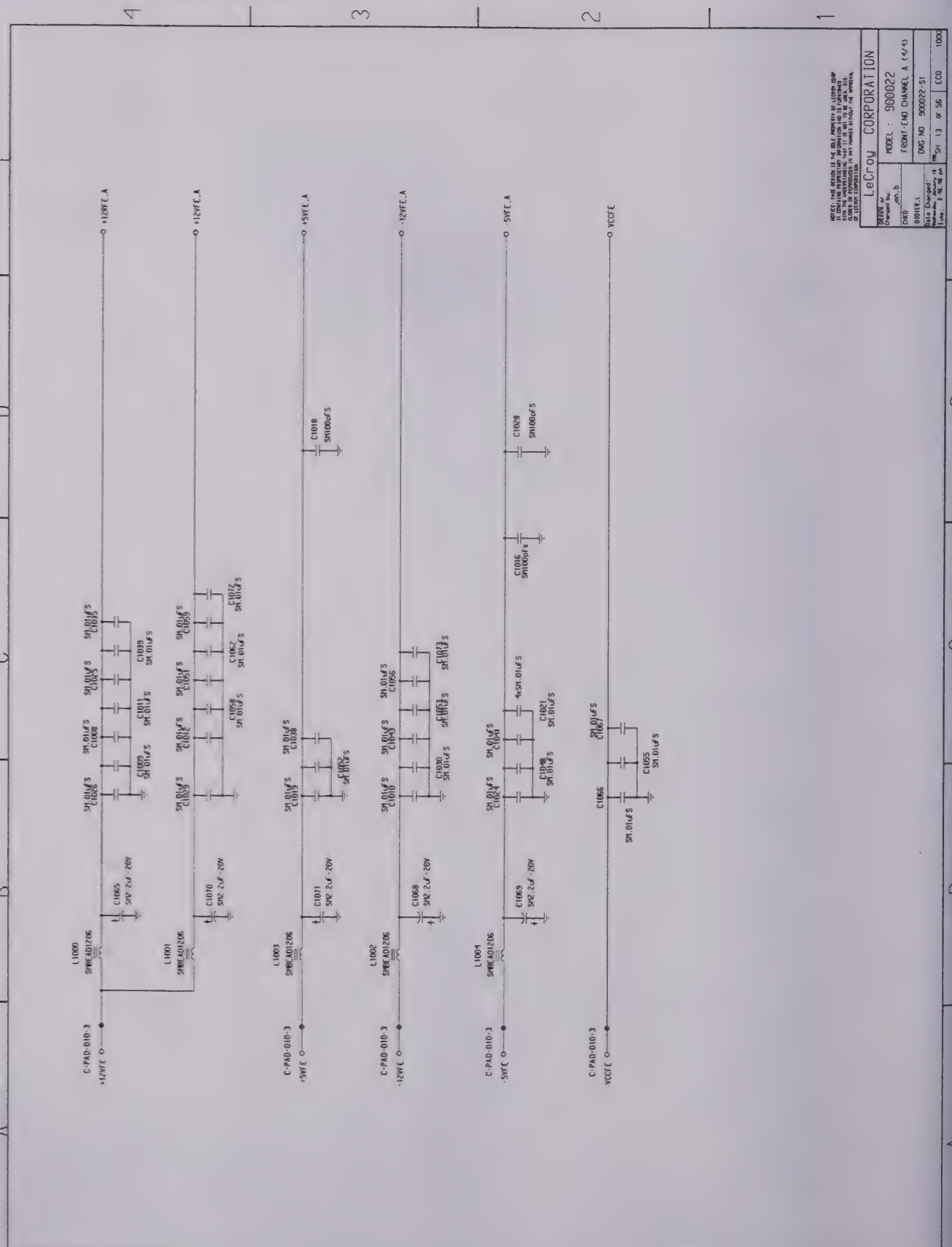

LeCroy CORPORATION
MODEL : 900022
FROM/-END (3/3)
DWG NO: 900022-SI
SH. 9 OF 56
ECO 1000
1 A
700 mA
850 mA
350 mA
800 mA

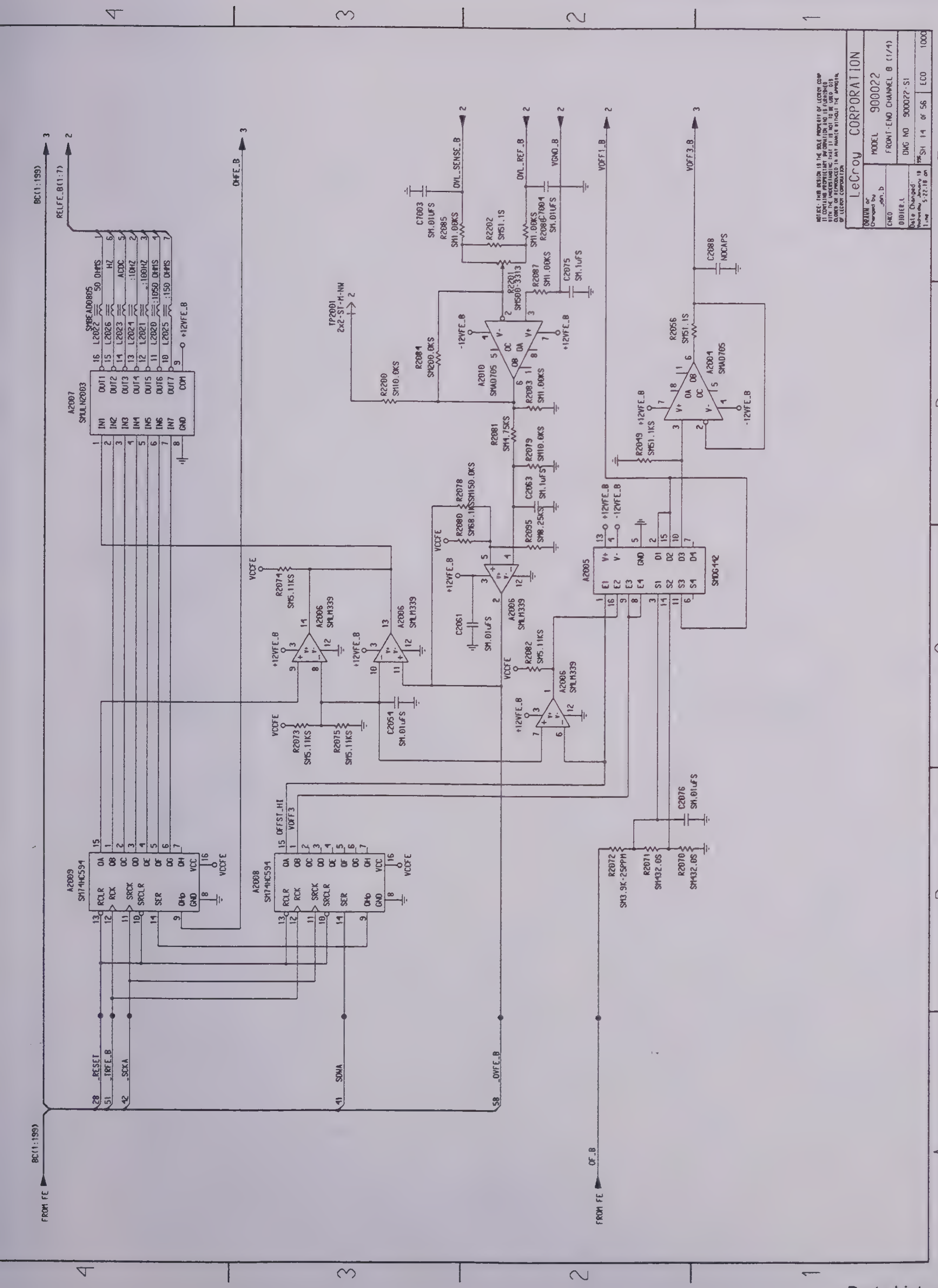

LeCroy CORPORATION
MODEL : 900022
FRONT-END CHANNEL A (1/4)
DWG NO 900022-S1
SH 10 OF 56
ECO 1000
DRAWN BY
DIDIER.L
CHKD
FROM FE
TO FE
RESET
SCKA
SDWA
OFF_A
OFFE_A
OFFF_A
VCCFE
-12VFE_A
+12VFE_A
A1007 SPXLN2003
A1008 SN74HCS94
A1009 SN74HCS94
A1006 SPLM339
A1005 SPDG442
A1010 SPAD705
A1004 SPAD705
A1011 SPAD705
SPRE.AD0805
2x2-ST-M-NW
C1054 SM.01uFS
C1061 SM.01uFS
C1075 SM.1uFS
C1076 SM.01uFS
C1088 ADCAPS
C7001 SM.01UFS
C7002 SM.01UFS
R1069 SM51.1KS
R1070 SM432.0S
R1071 SM432.0S
R1072 SM3.9K-25PPM
R1073 SM5.11KS
R1074 SM5.11KS
R1075 SM5.11KS
R1082 SM5.11KS
R1084 SM200.0KS
R1085 SM1.00KS
R1086 SM1.00KS
R1087 SM1.00KS
R1088 SM8.25KS
R1089 SM8.1KS
R1095 SM8.25KS
R1200 SM10.0KS
R1201 SM500-331S
R1202 SM51.1S
R1055 SM51.1S
R1078 SM150.0KS
R1079 SM10.0KS
R1081 SM4.75KS
R1083 SM1.00KS
OVL_SENSE_A
OVL_REF_A
VGND_A
VOFF1_A
VOFF3_A


LeCroy CORPORATION
MODEL : 900022
FRONT-END CHANNEL A (2/4)
DWG NO 900022-S1
SH 11 OF 56
INPUT
J1000
BNC-93XX-PR08E
Mechanical Support for RLx001
NO PLATED HOLE ON PIN 4
Ground Loop nocaps
Cx032 compensation
RELAY_A(1:7)
PRG_A
VGND_A
OVL_REF_A
OVL_SENSE_A
BUF50_A
VOFF2_A
VOFF1_A
+12VFE_A
-12VFE_A
+5VFE_A
-5VFE_A
50 OHMS
1050 OHMS
100MZ
20MZ
ACDC

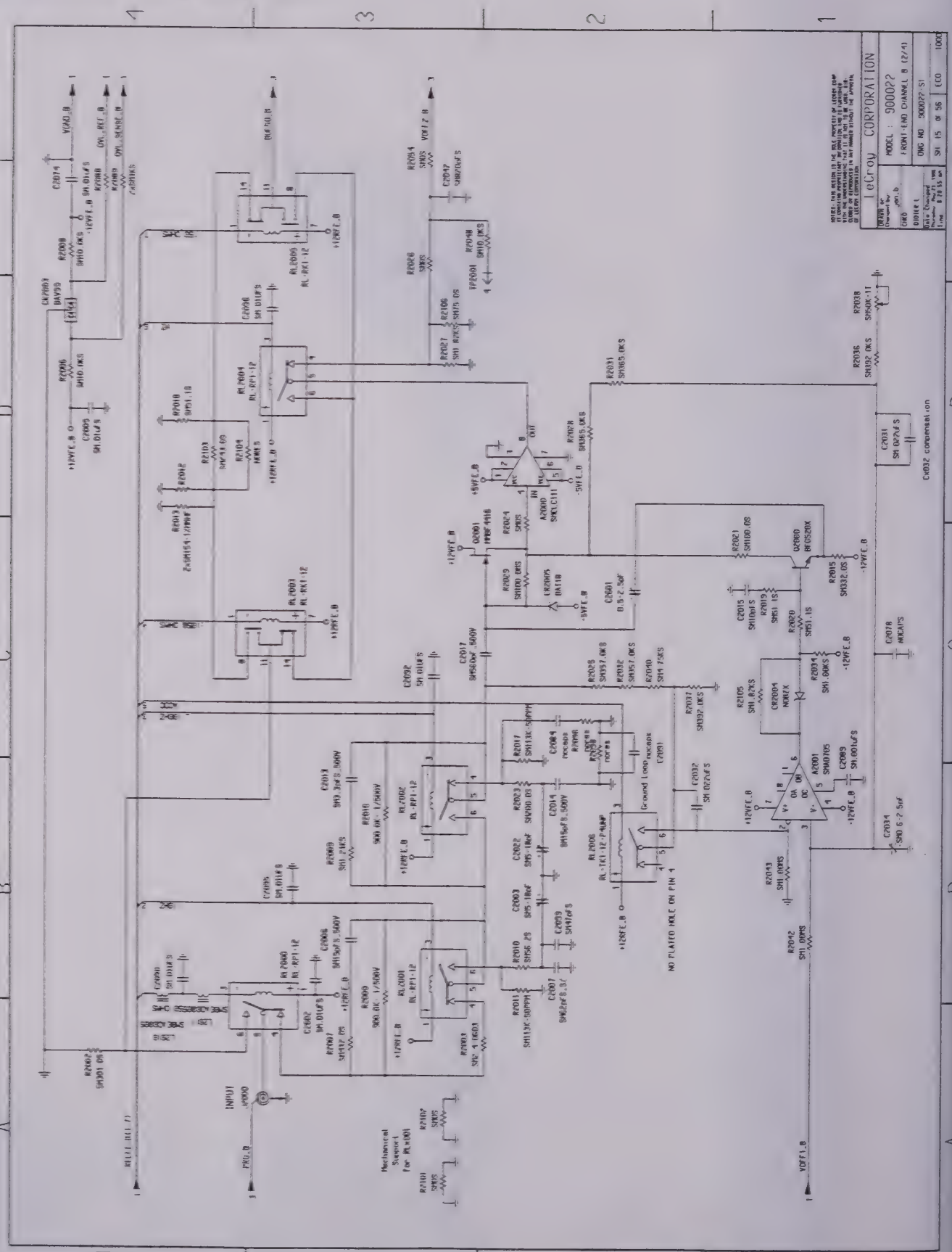


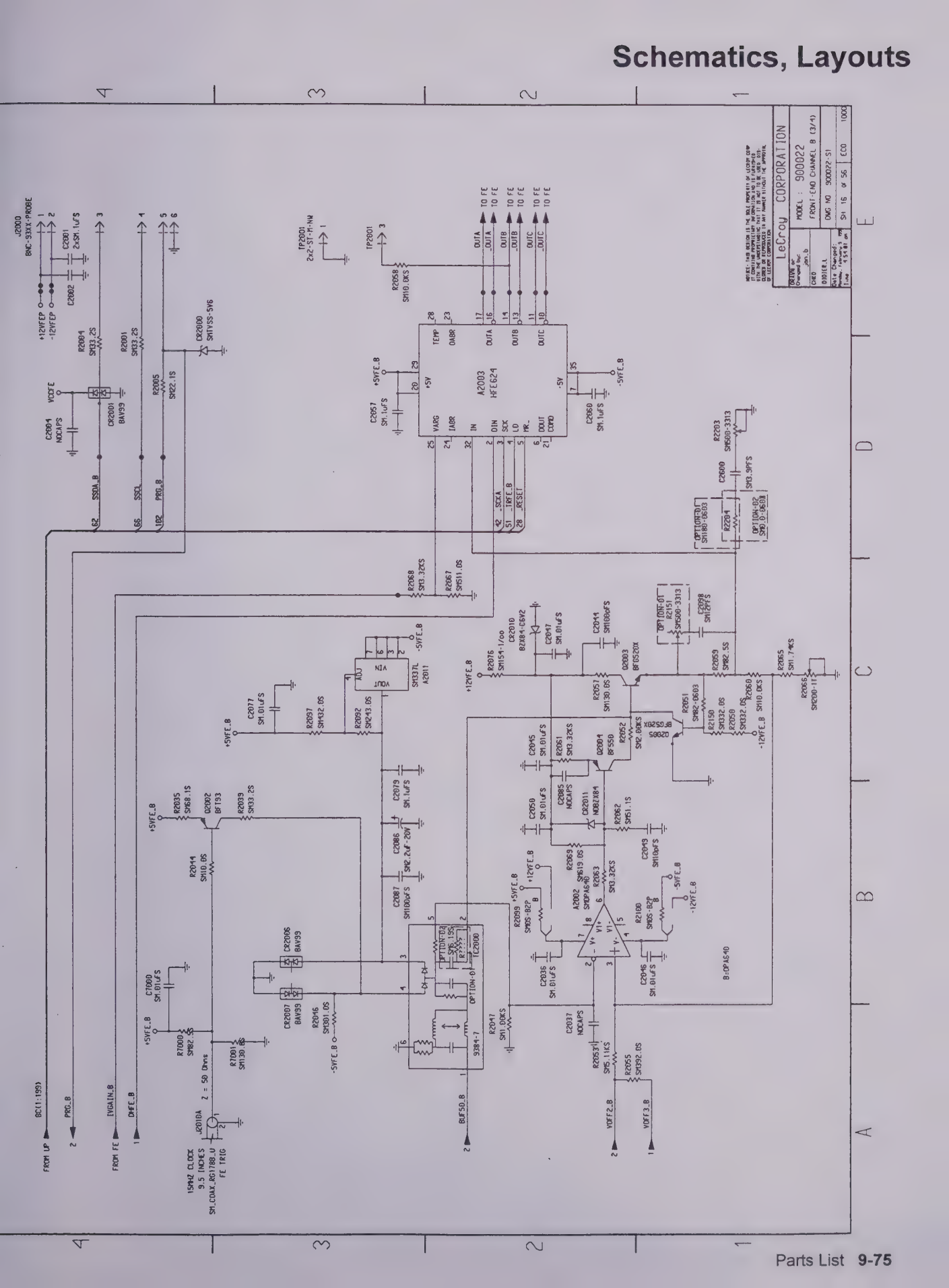
Schematics, Layouts

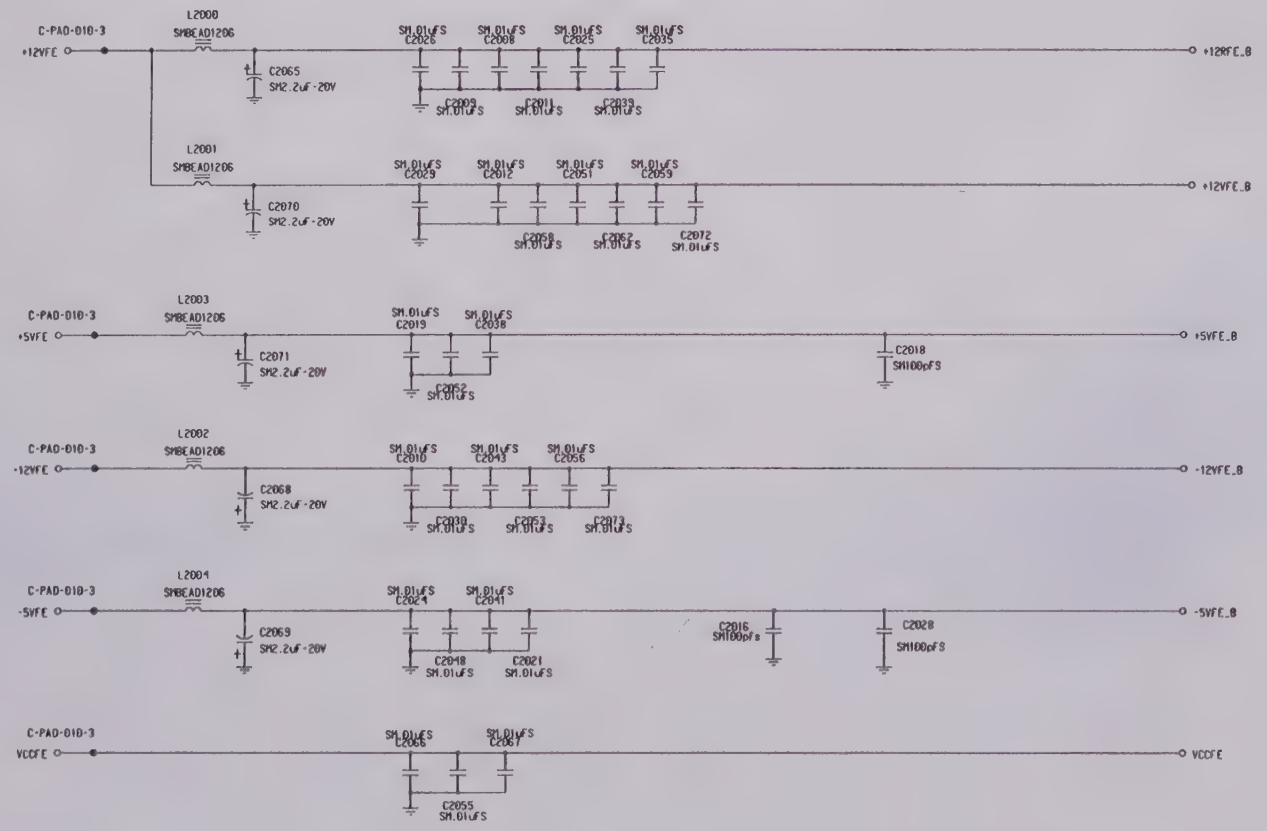



LeCroy CORPORATION
MODEL 900022
FRONT-END CHANNEL B (1/4)
DWG NO 900022-S1
SH 14 of 56
FROM FE
BC(1:199)
RELFE_B(1:7)
OHFE_B
DVL_SENSE_B
DVL_REF_B
VGND_B
VOFF1_B
VOFF3_B
OF_B
OVFE_B
SDNA
_SCKA
_TRFE_B
_RESET
A2009 SM74HC594
A2008 SM74HC594
A2007 SMULN2003
A2005 SMDG442
A2006 SMLM339
A2010 SMAD705
A2004 SMAD705

Schematics, Layouts







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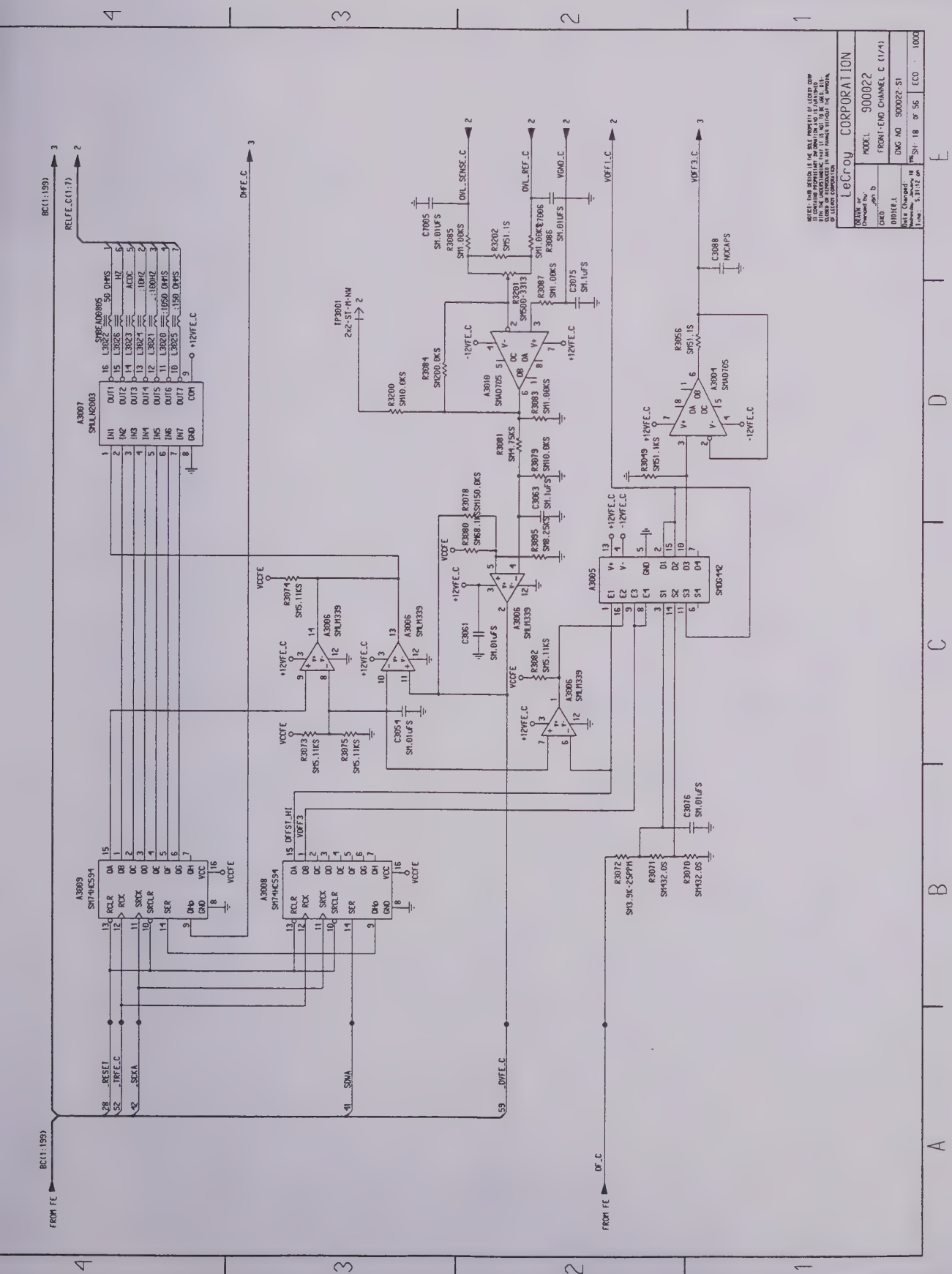
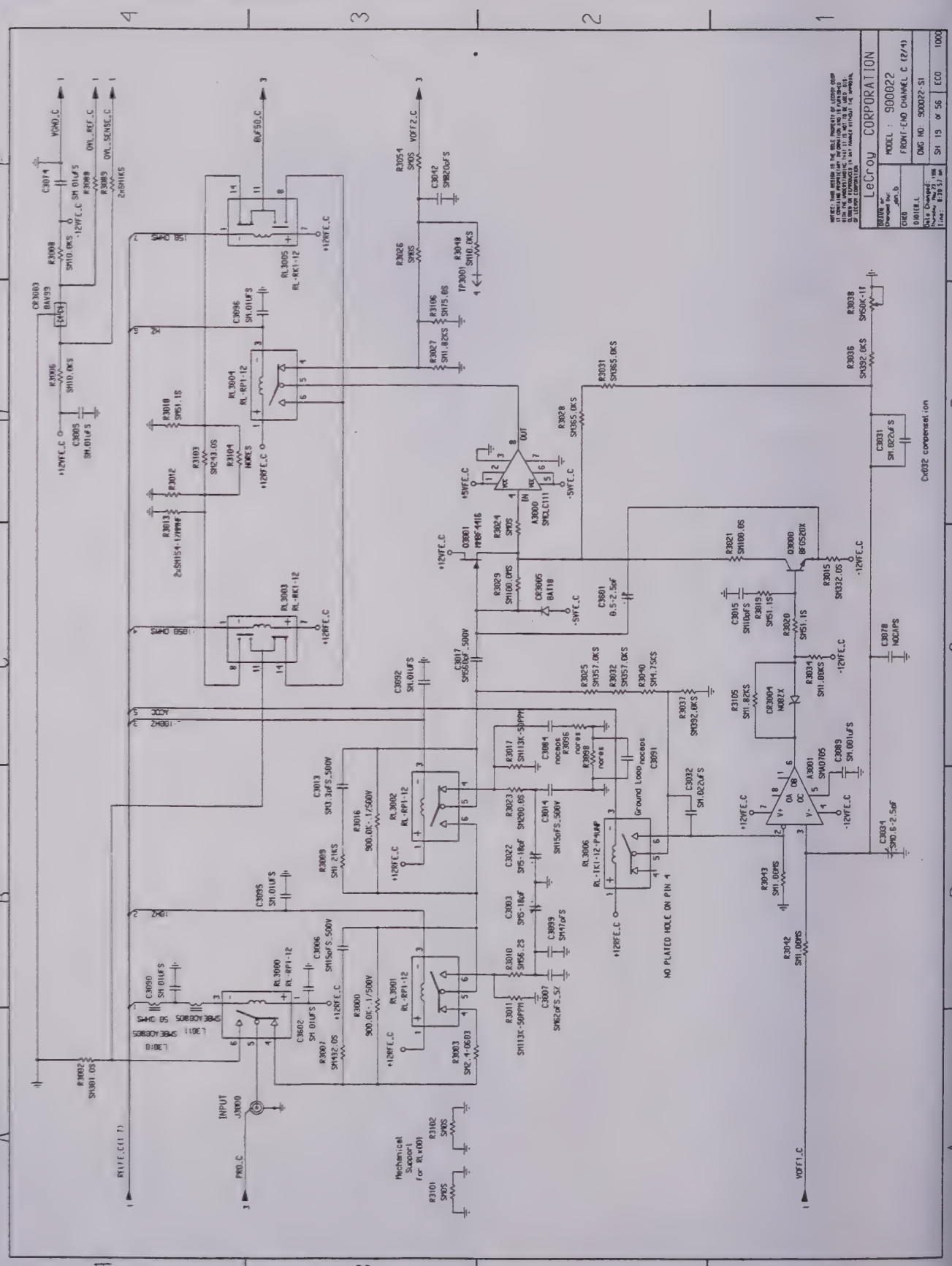
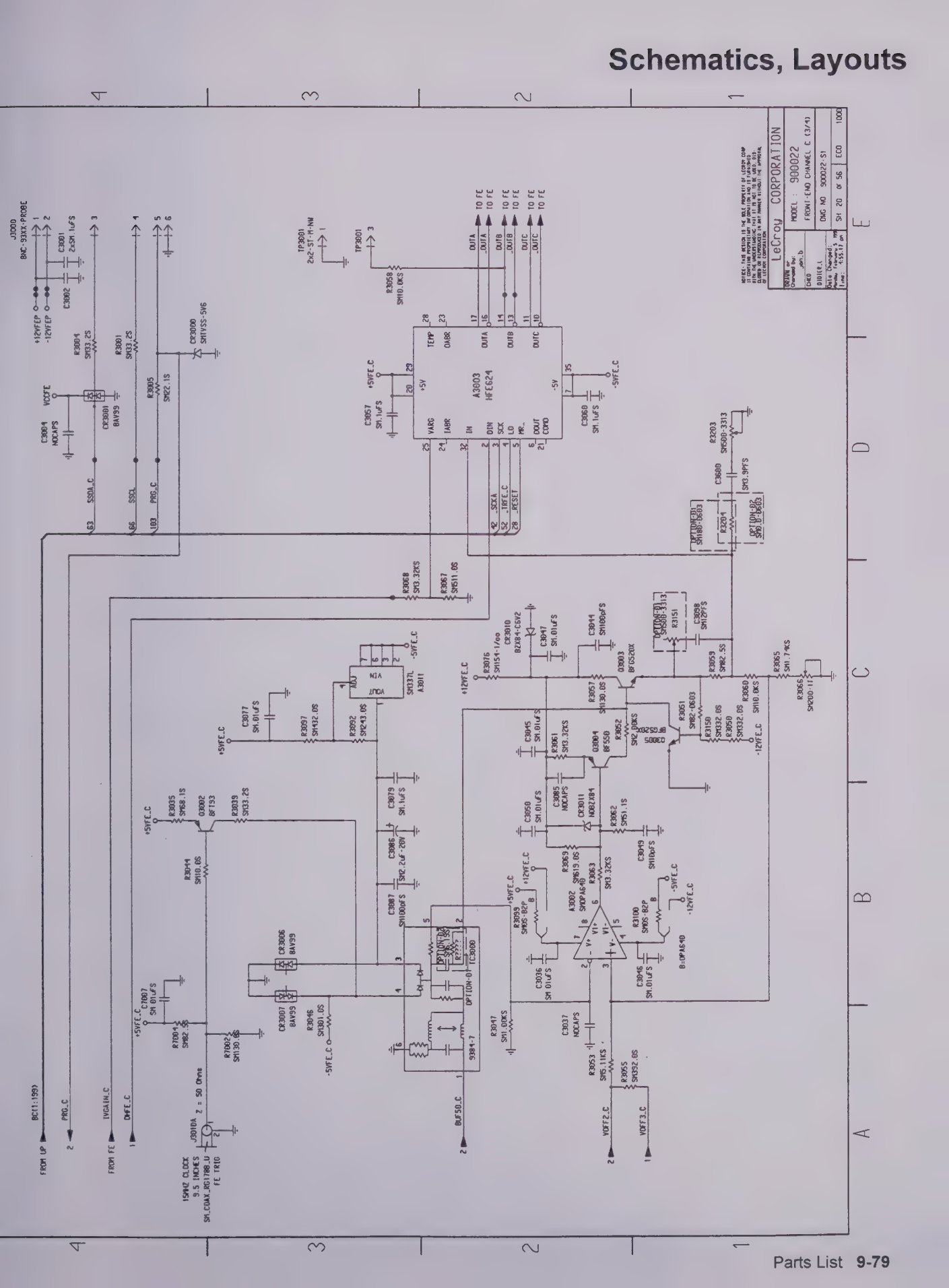
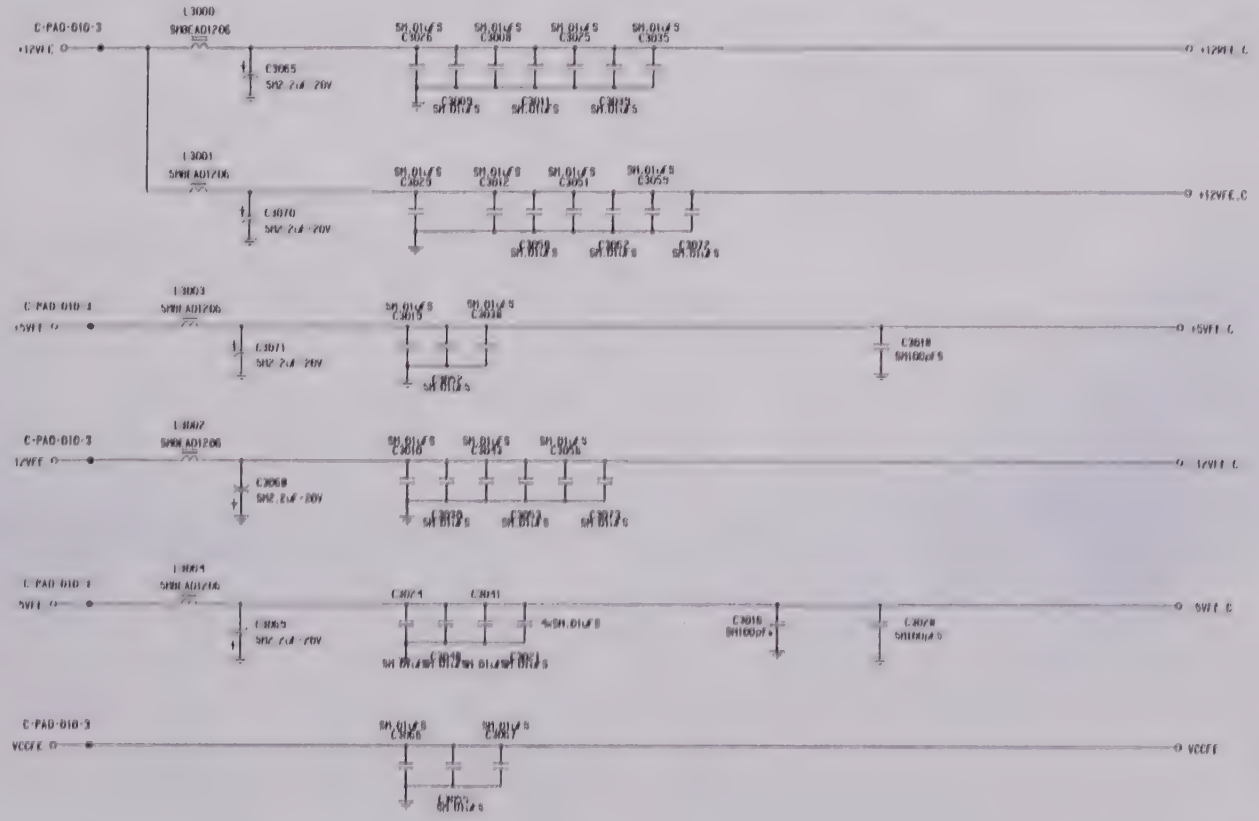
LeCroy CORPORATION

DRAWN or Changed by: jan.b	MODEL 900022
CHKD DIDIER.L	FRONT-END CHANNEL B (1/1)
Date Changed: Wednesday, January 10 time: 5:28:38 pm	DWG NO 900022-S1
	SH 17 OF 56 ECO 1000


LeCroy CORPORATION
MODEL 900022
FRONT-END CHANNEL C (1/4)
DWG NO 900022-S1
SH: 18 OF 56
ECO 1000
FROM FE
BC(1:199)
RELFE_C(1:7)
OHFE_C
OF_C
OVL_SENSE_C
OVL_REF_C
VGND_C
VOFF1_C
VOFF3_C
A3007 SMULN2003
A3009 SM74HC594
A3008 SM74HC594
A3006 SMLM339
A3005 SMDG442
A3004 SMAD705
A3010 SMAD705
TP3001 2x2-ST-M-NW
SMBEAD0805
+12VFE_C
-12VFE_C
VCCFE
VOFF3
OFFST_HI
_RESET
_TRFE_C
_SCKA
_SDWA
_OVFE_C


LeCroy CORPORATION
MODEL : 900022
FRONT-END CHANNEL C (2/4)
DWG NO: 900022-S1
SH 19 OF 56
ECO
INPUT J3000
NO PLATED HOLE ON PIN 4
Mechanical Support for RL3001
Ground Loop nocaps C3091
Cx032 connection





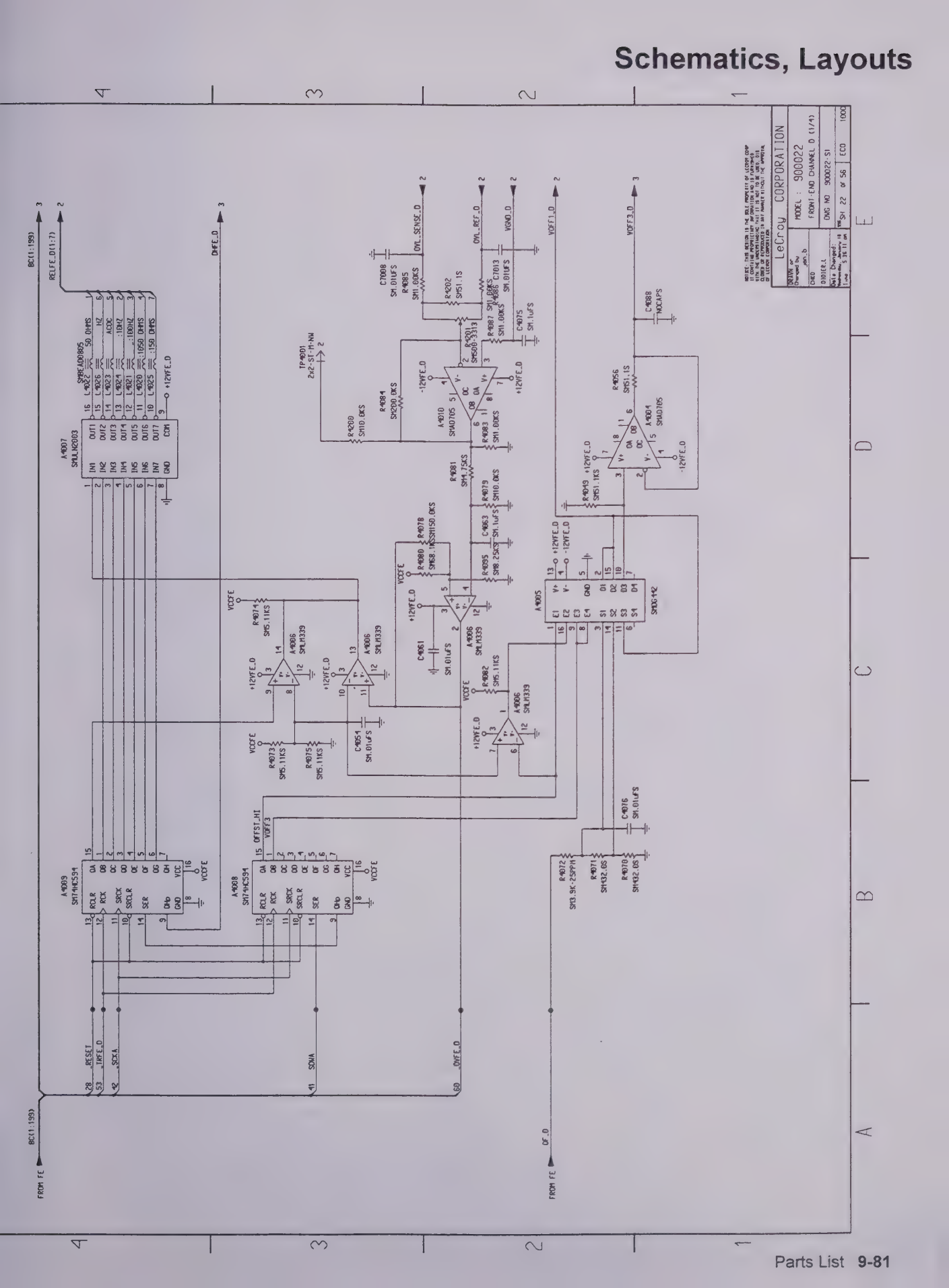
LeCroy CORPORATION

MODEL 900022

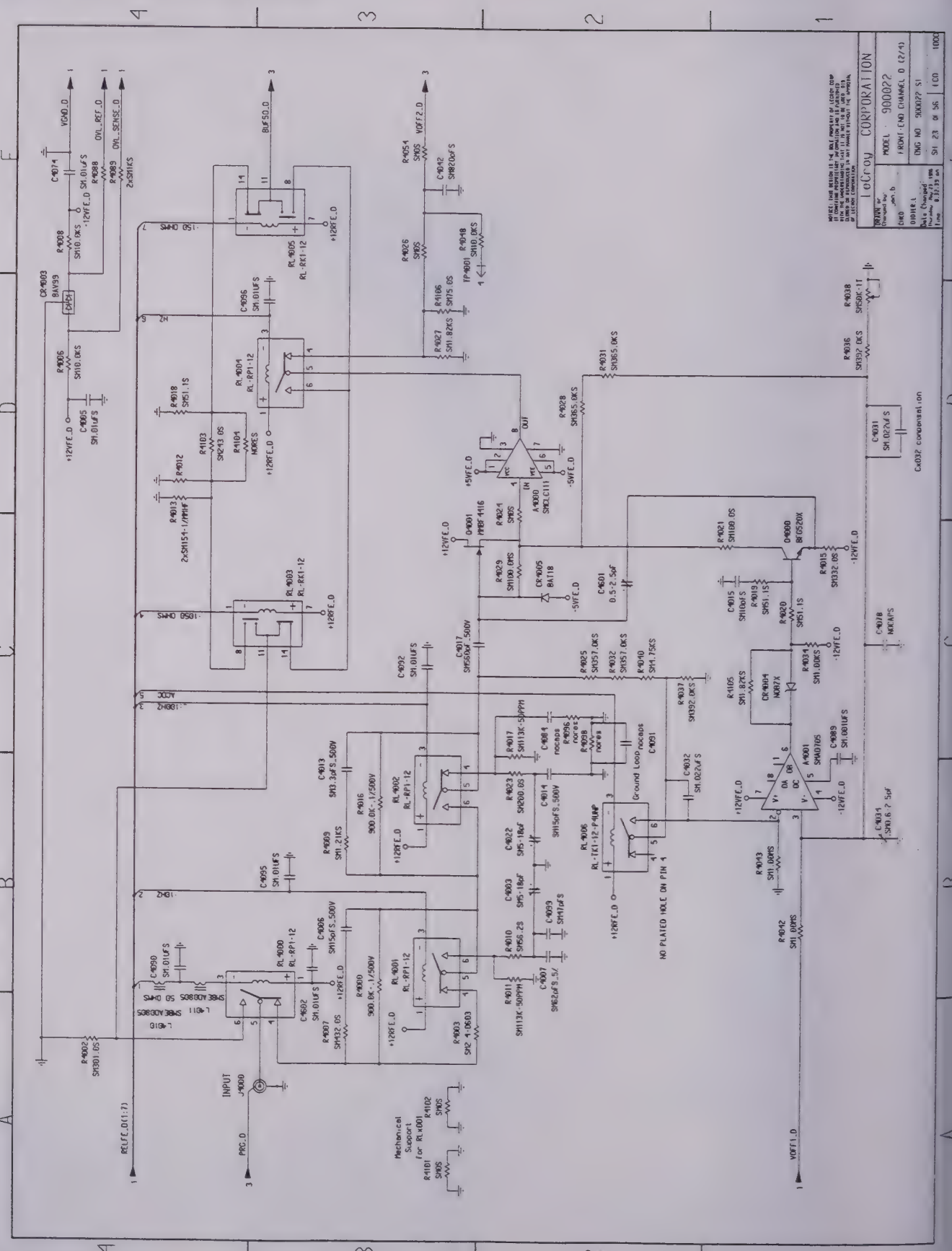
FRONT END CHANNEL C (4/4)

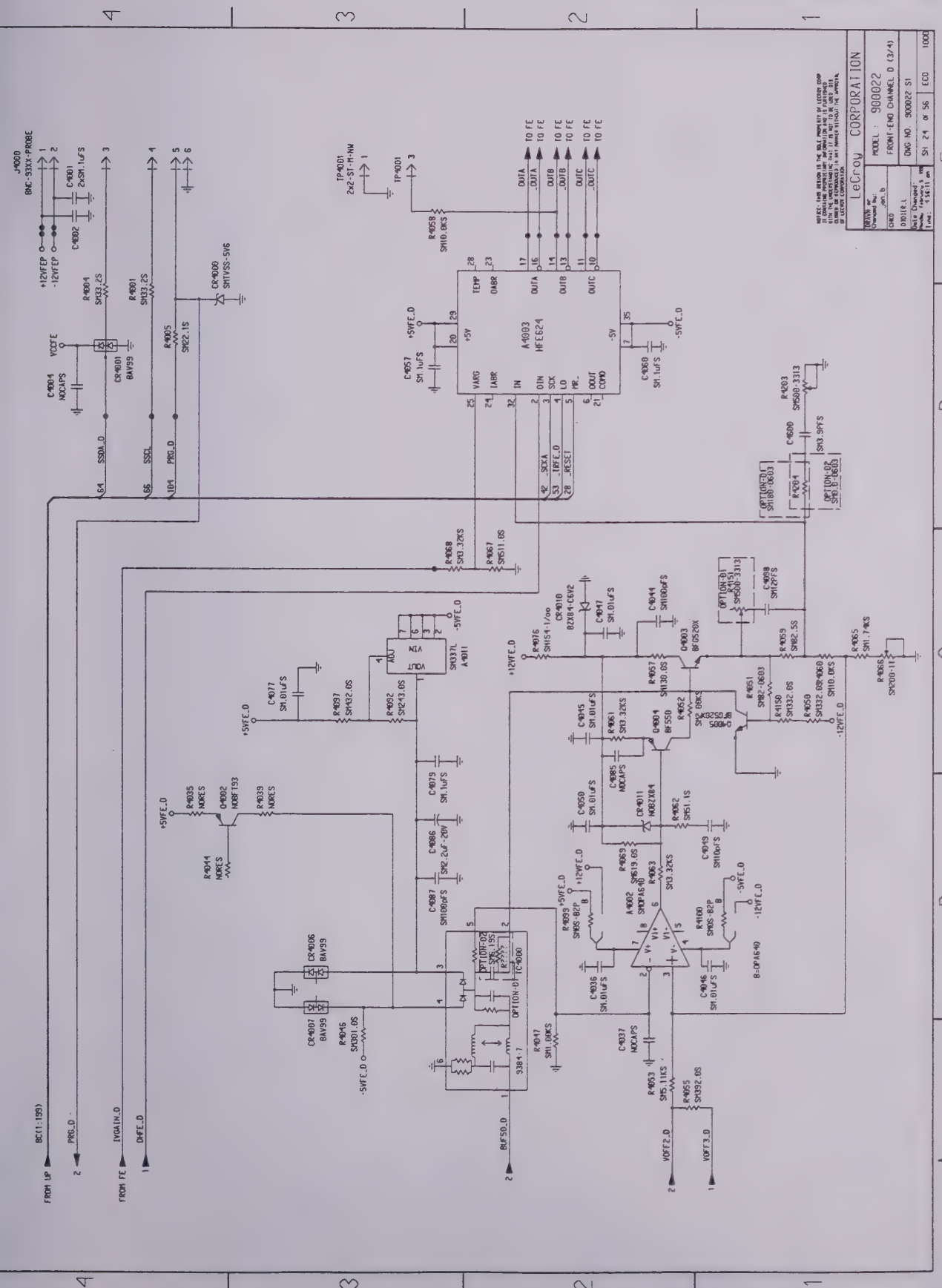
DWG NO 900022 S1

SH 21 OF 36 REV 1000



Schematics, Layouts




LeCroy CORPORATION
MODEL : 900022
FRONT-END CHANNEL D (3/4)
DWG NO. 900022 S1
SH 24 OF 56
ECO
A4003
HFE624
A4011
SN337L
A4002
A-OPA640
Q4003
BFG520X
Q4004
BF550
Q4002
NOBFT93
CR4001
BAV39
CR4006
BAV39
CR4007
BAV39
CR4008
SMTVSS-5V6
J4000
BNC-933X-PROBE
TP4001
2x2-ST-M-NW
FROM UP
FROM FE
BC(1:19)
PRG_D
IVGAIN_D
DHFE_D
BUFSO_D
VOFF2_D
VOFF3_D
TO FE
OUTA
OUTB
OUTC
+5VFE_D
-5VFE_D
+12VFE_D
-12VFE_D
+12VFEP
-12VFEP
VCCFE
SSDA_D
SSCL
PRG_D
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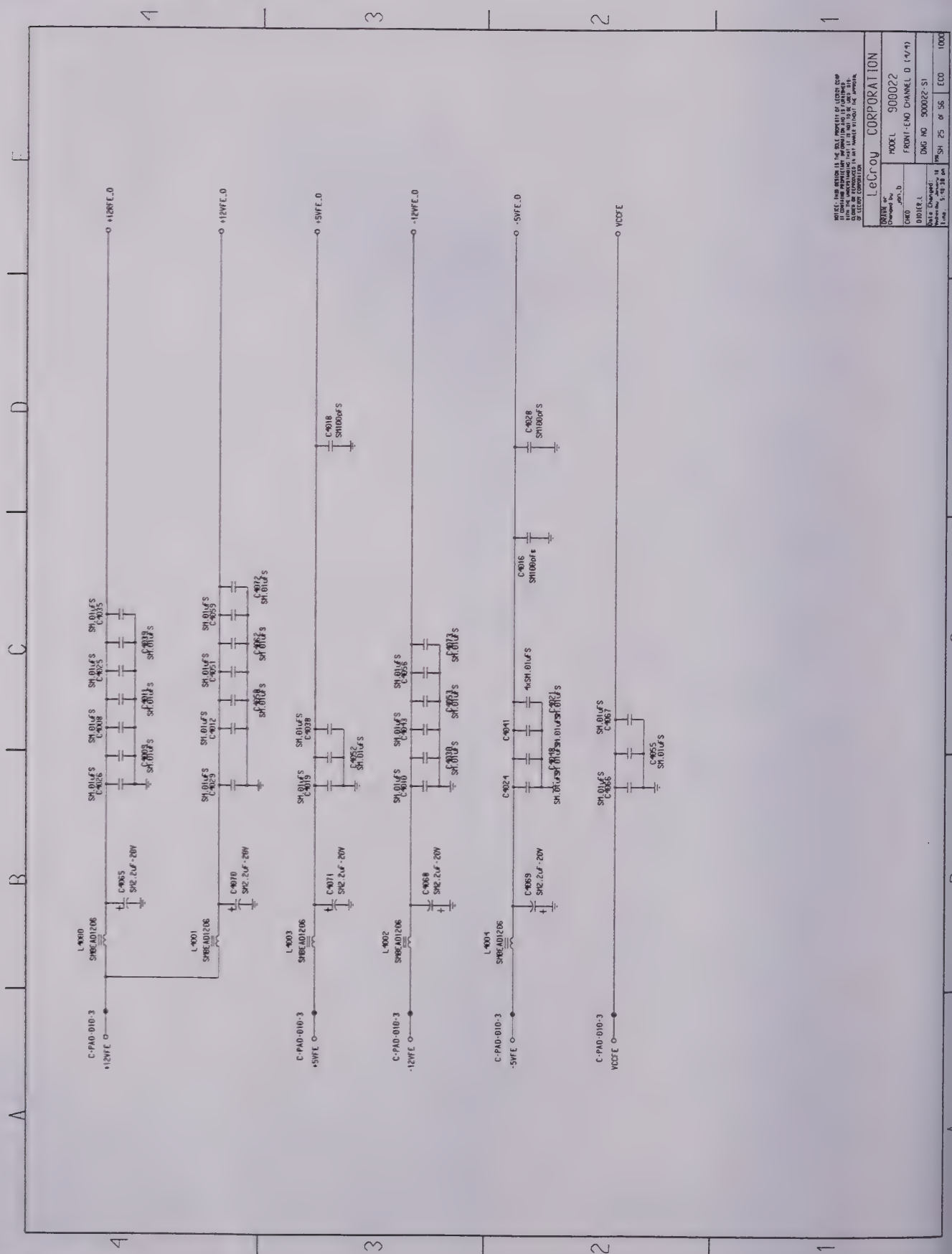
LeCroy CORPORATION
MODEL 900022
FRONT-END CHANNEL D (4/4)
DWG NO 900022-S1
SH 25 OF 56
ECO 1000
+12VFE_D
+5VFE_D
-12VFE_D
-5VFE_D
VCCFE
C-PAD-010-3
+12VFE
+5VFE
-12VFE
-5VFE
VCCFE
L4010
L4001
L4003
L4002
L4004
SMBEAD1206
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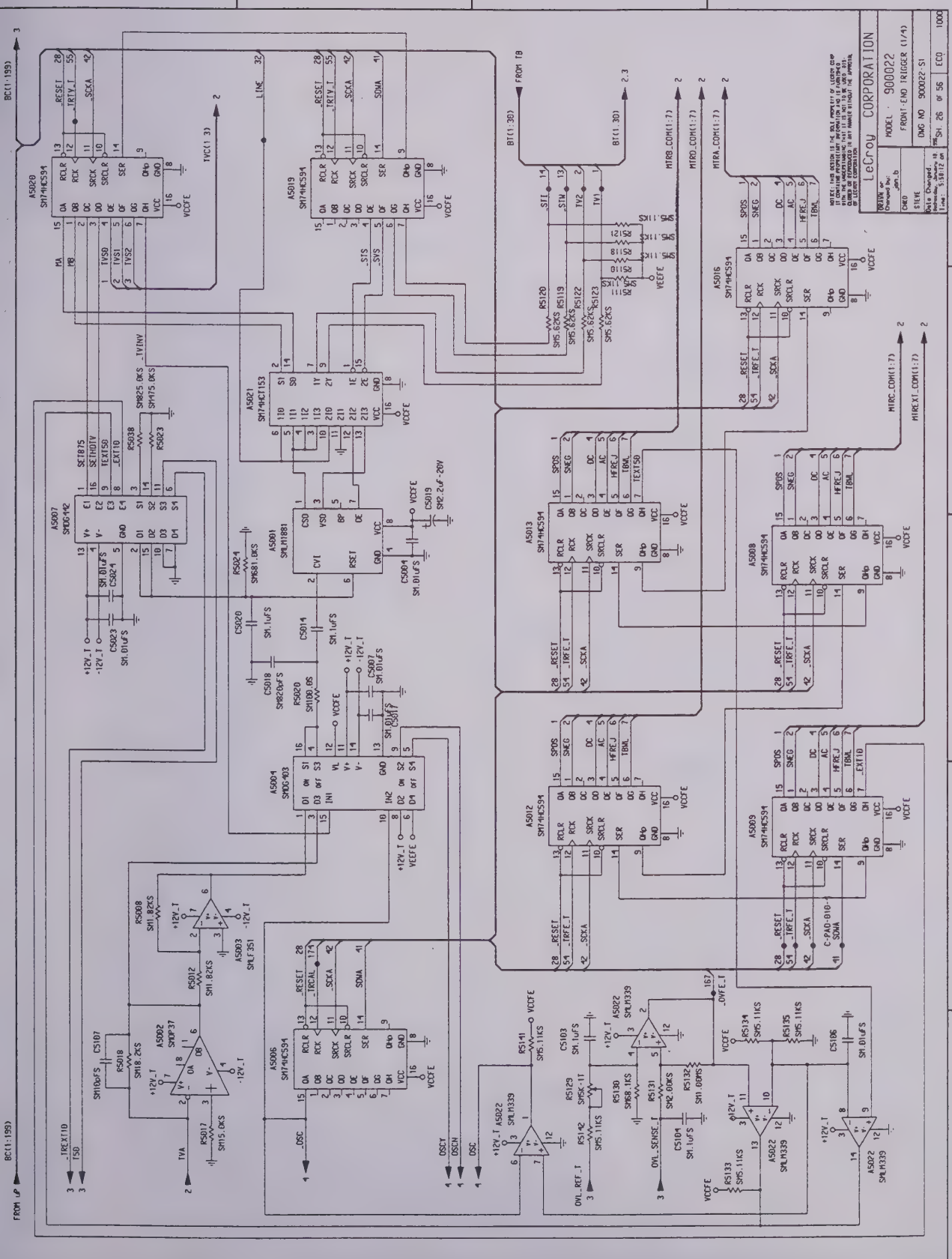
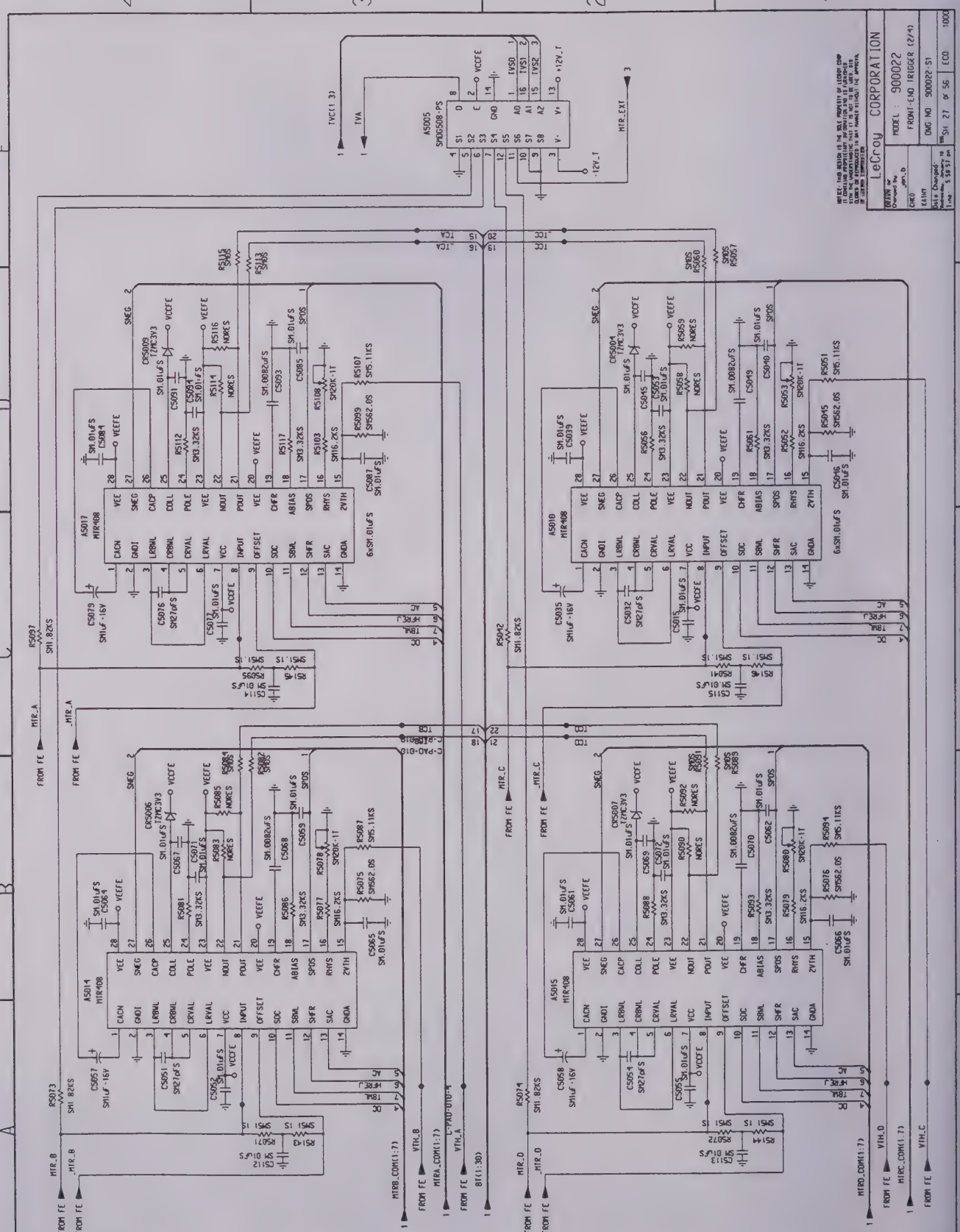
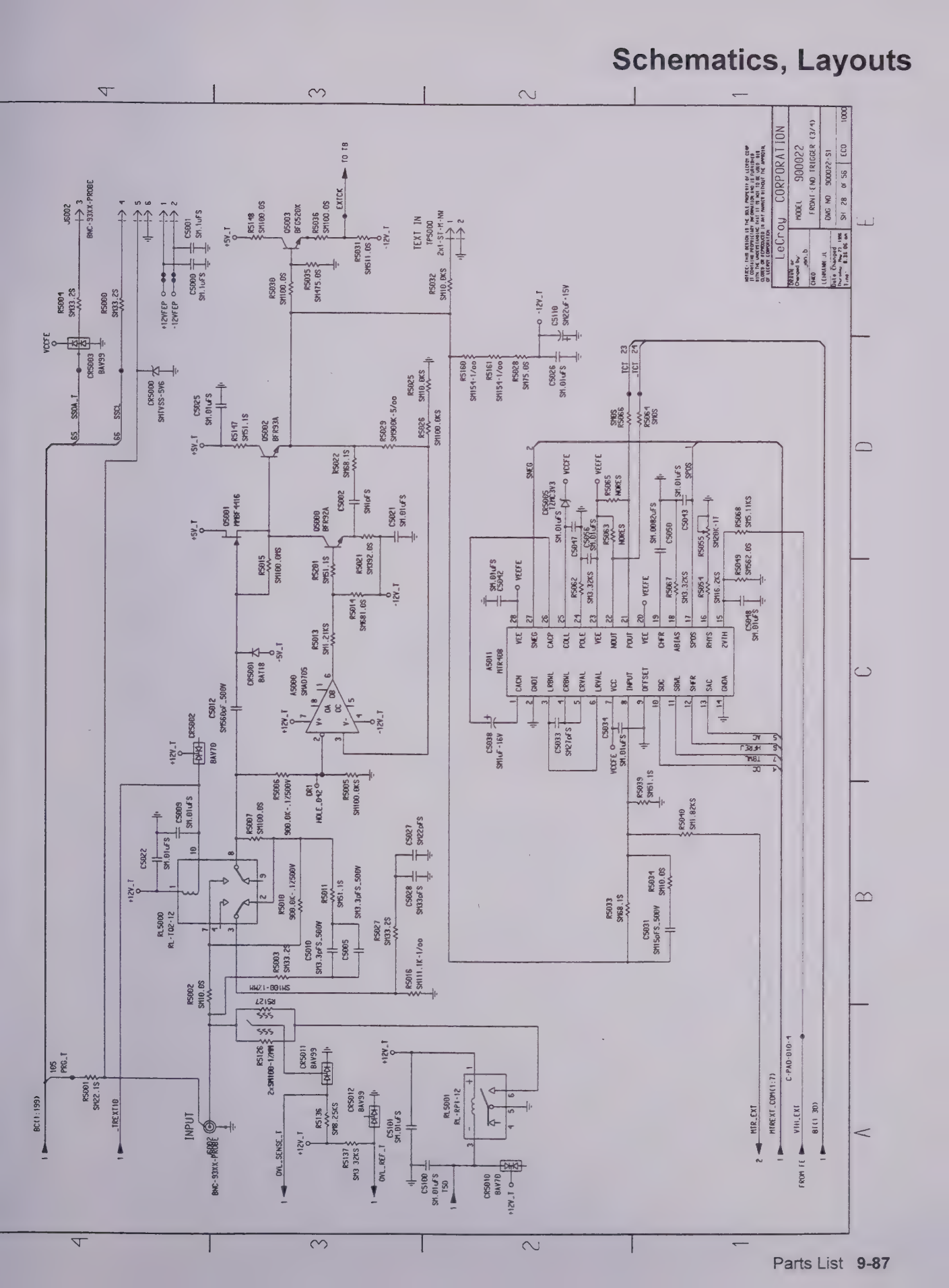
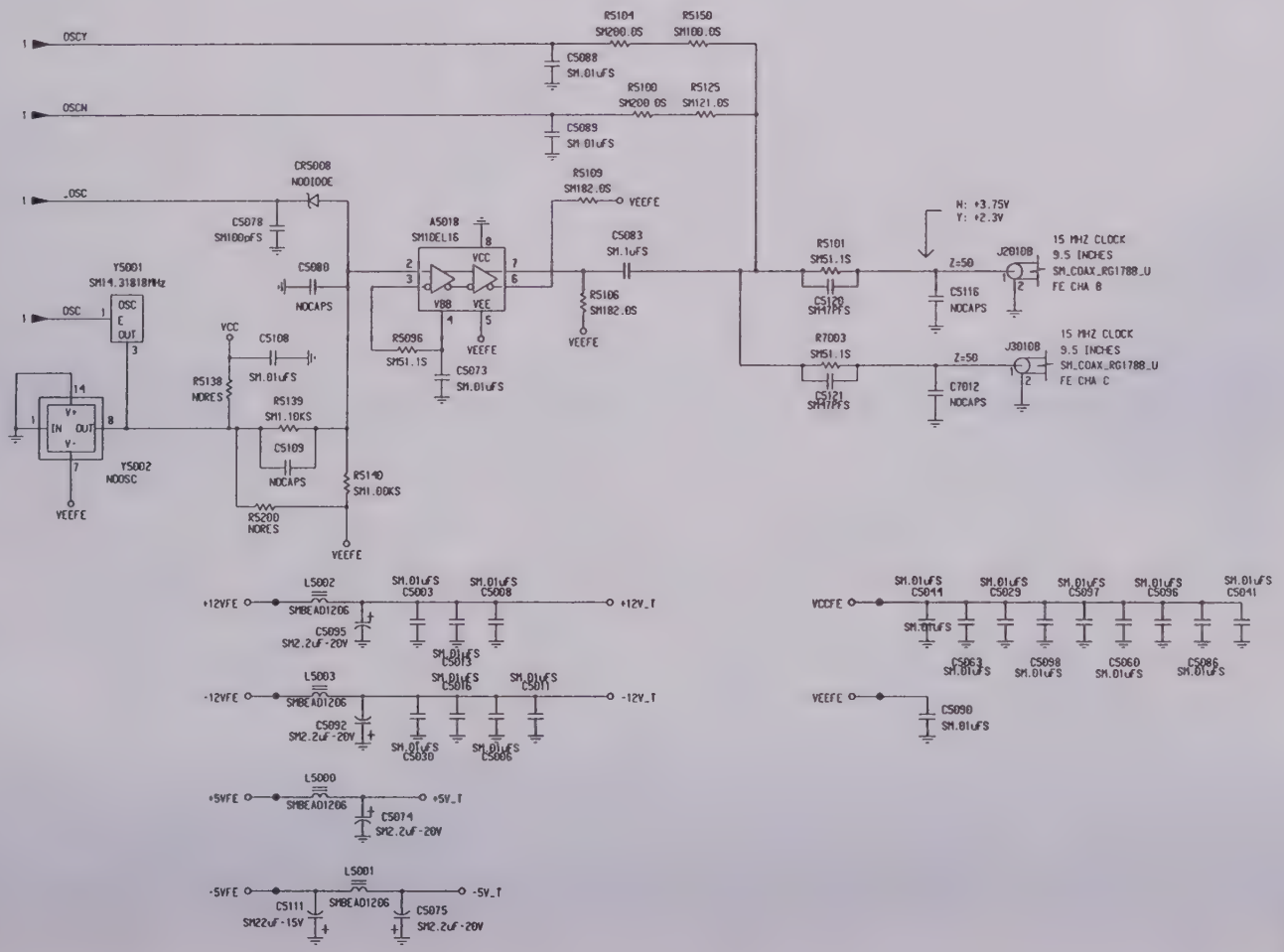
SM.01uFS
SM2.2uF-20V
SM100pFS
4xSM.01uFS



Schematics, Layouts

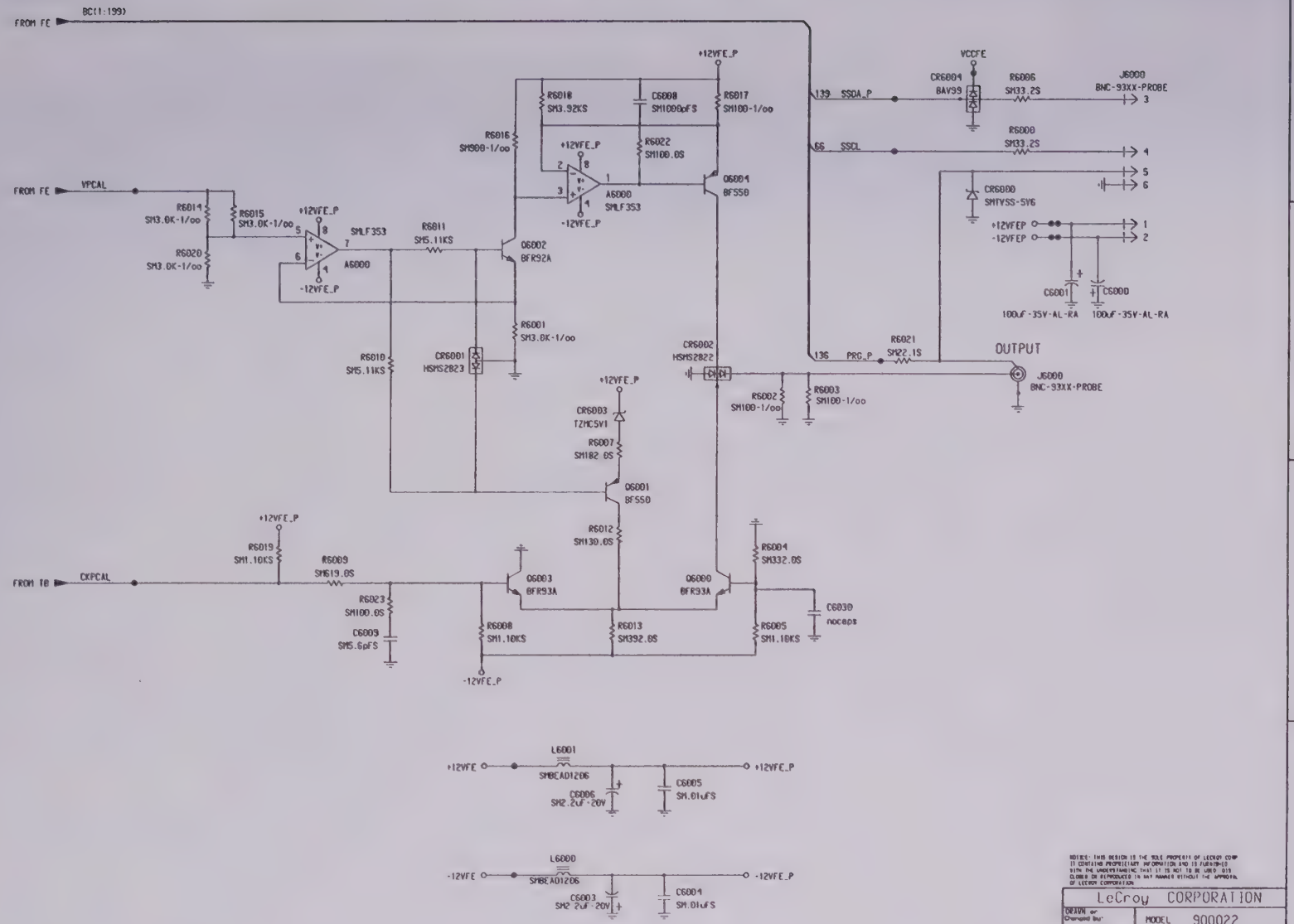


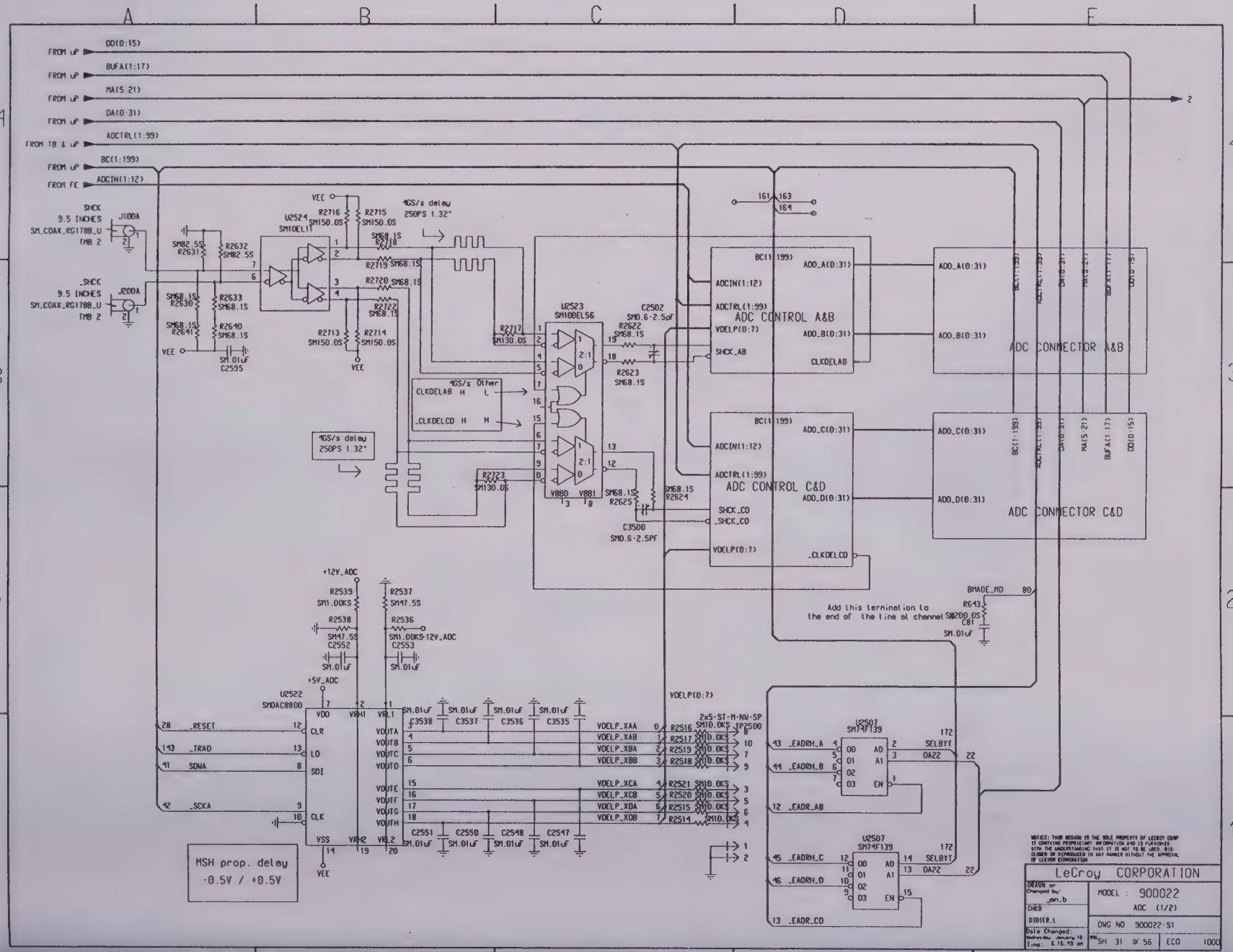


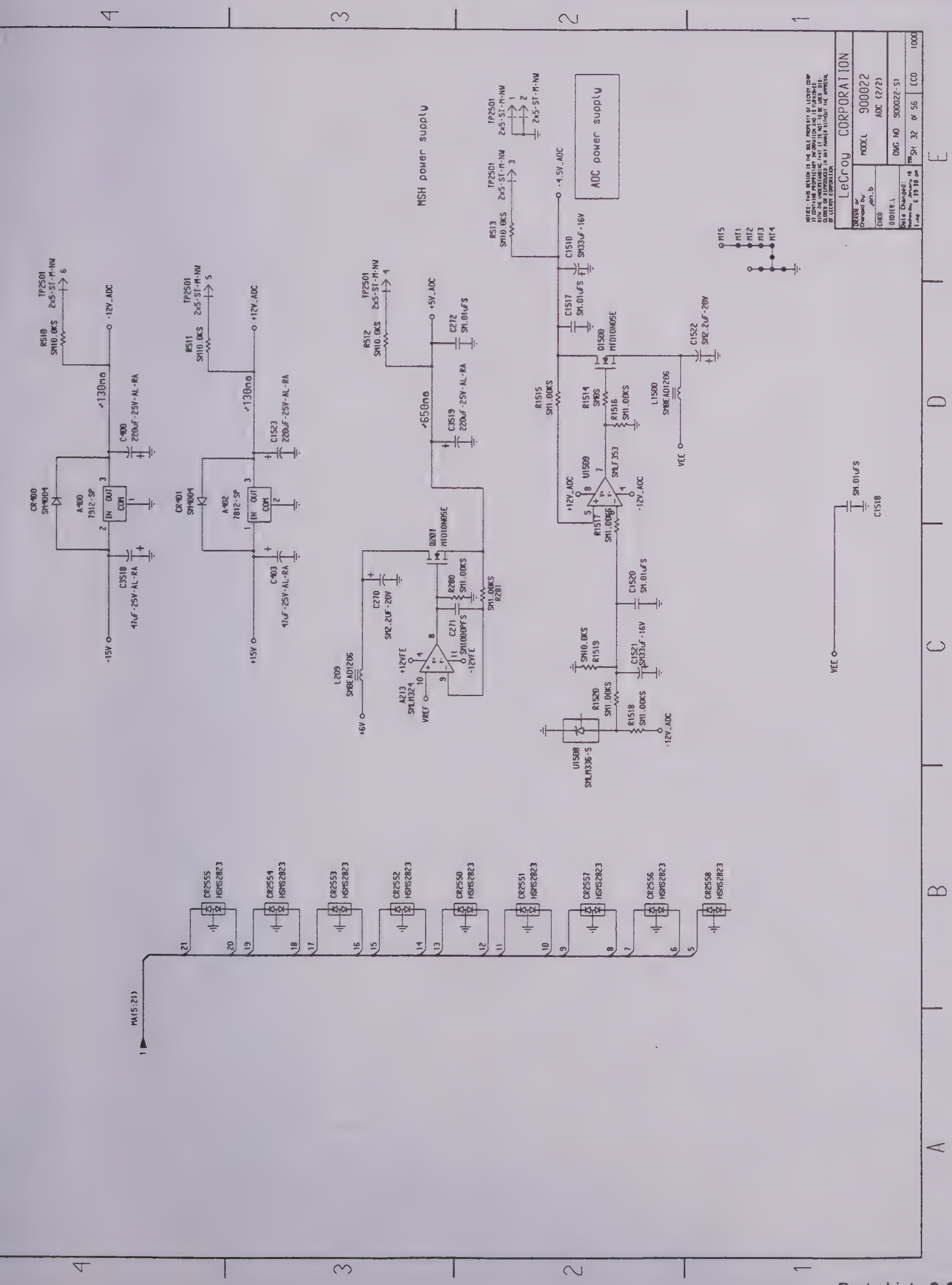


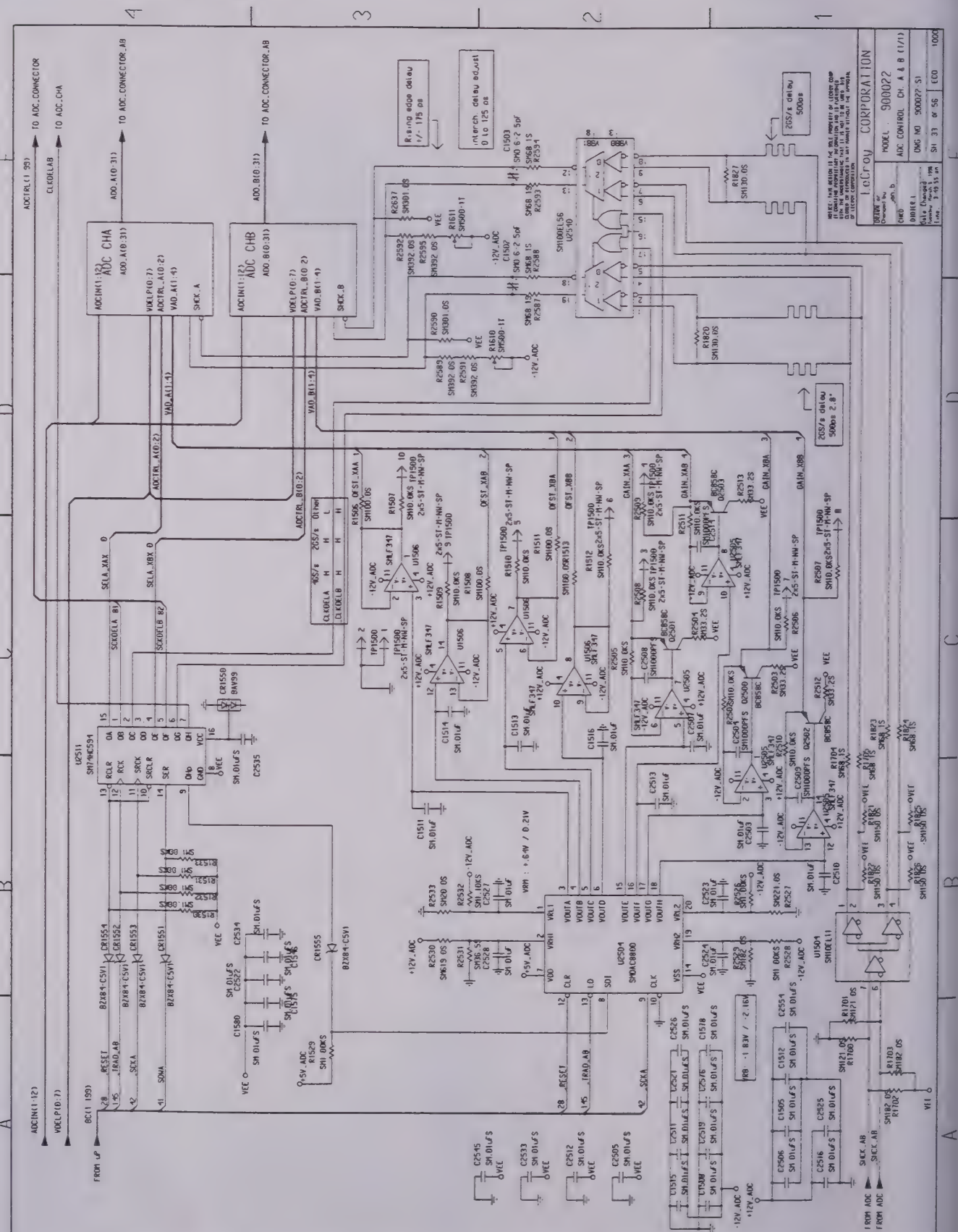
NOTICE: THIS DESIGN IS THE SOLE PROPERTY OF LECROY CORP IT CONTAINS PROPRIETARY INFORMATION AND IS FURNISHED WITH THE UNDERSTANDING THAT IT IS NOT TO BE USED, DISCLOSED OR REPRODUCED IN ANY MANNER WITHOUT THE APPROVAL OF LECROY CORPORATION

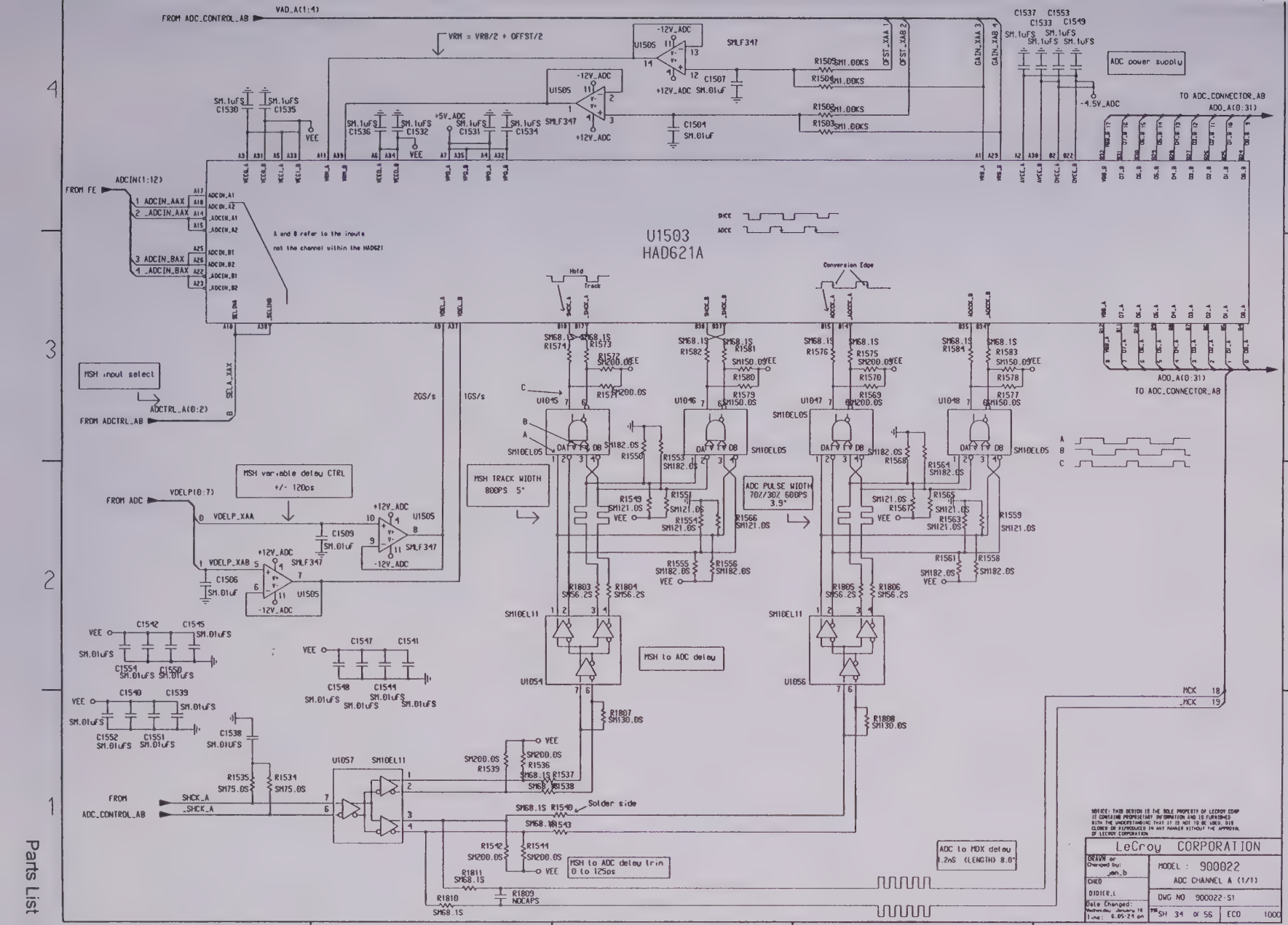
LeCroy CORPORATION		
DRAWN BY: Changed by: jon_b	MODEL : 900022	
CHKD: KATHY	FRONT-END TRIGGER (1/4)	
Date Changed: Wednesday, January 18 time 6:01:23 pm	DWG NO 900022-S1	
	SH 29 OF 56	ECO 1000

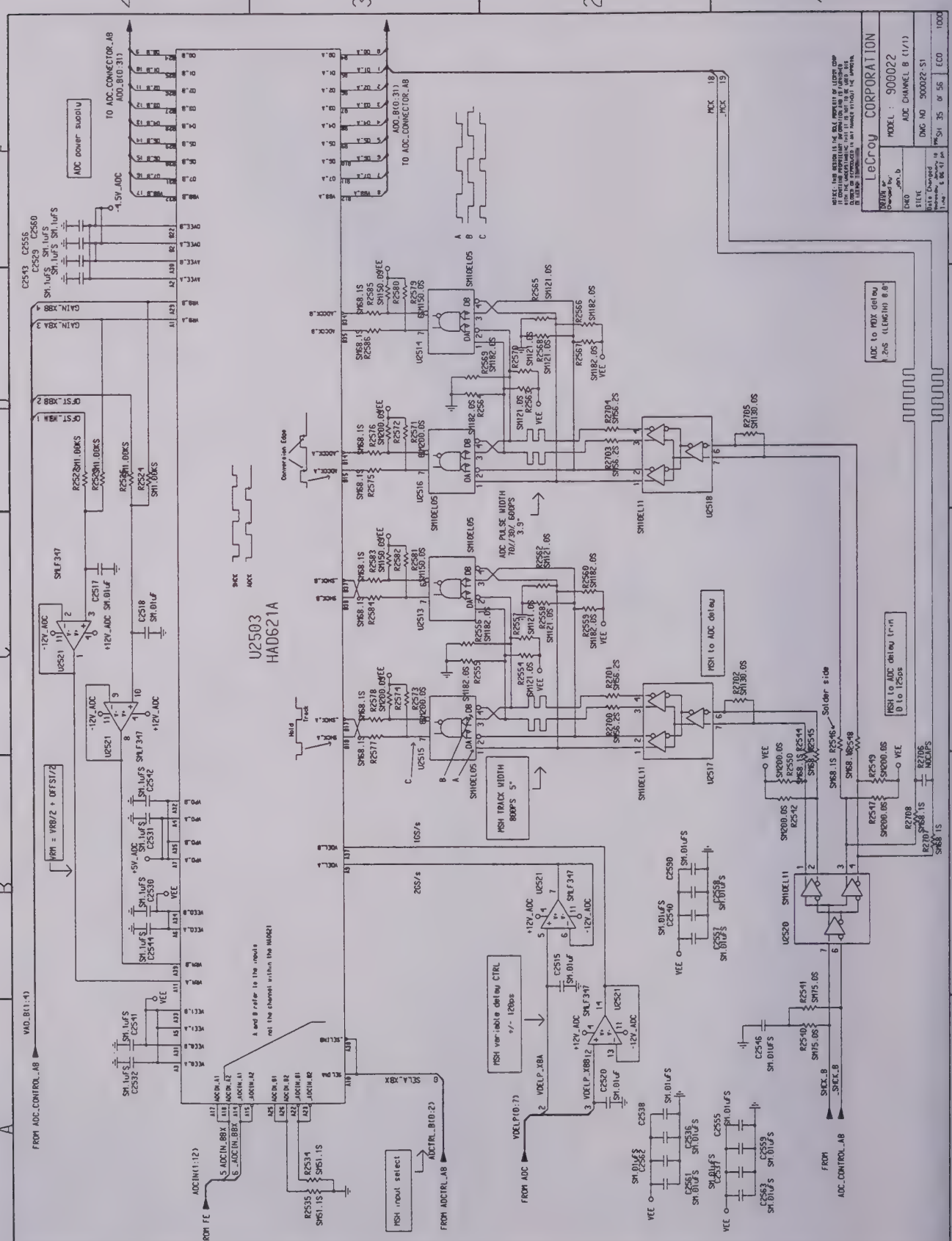

PROBE CALIBRATOR
FROM FE
BC(1:199)
VPCAL
CKPCAL
FROM TB
+12VFE_P
-12VFE_P
VCCFE
SSDA_P
SSCL
PRG_P
OUTPUT
SMLF353
BAV99
BFR92A
BFS50
BFR93A
HSMS2822
HSMS2823
TZMC5V1
SMTVSS-SV6
BNC-93XX-PROBE
100uF-35V-AL-RA
+12VFE
-12VFE
SMBEAD1206
LeCroy CORPORATION
900022
FRONT-END PROBE CAL. (1/1)
DWG NO 900022-S1
SH 30 OF 56
ECO 1000

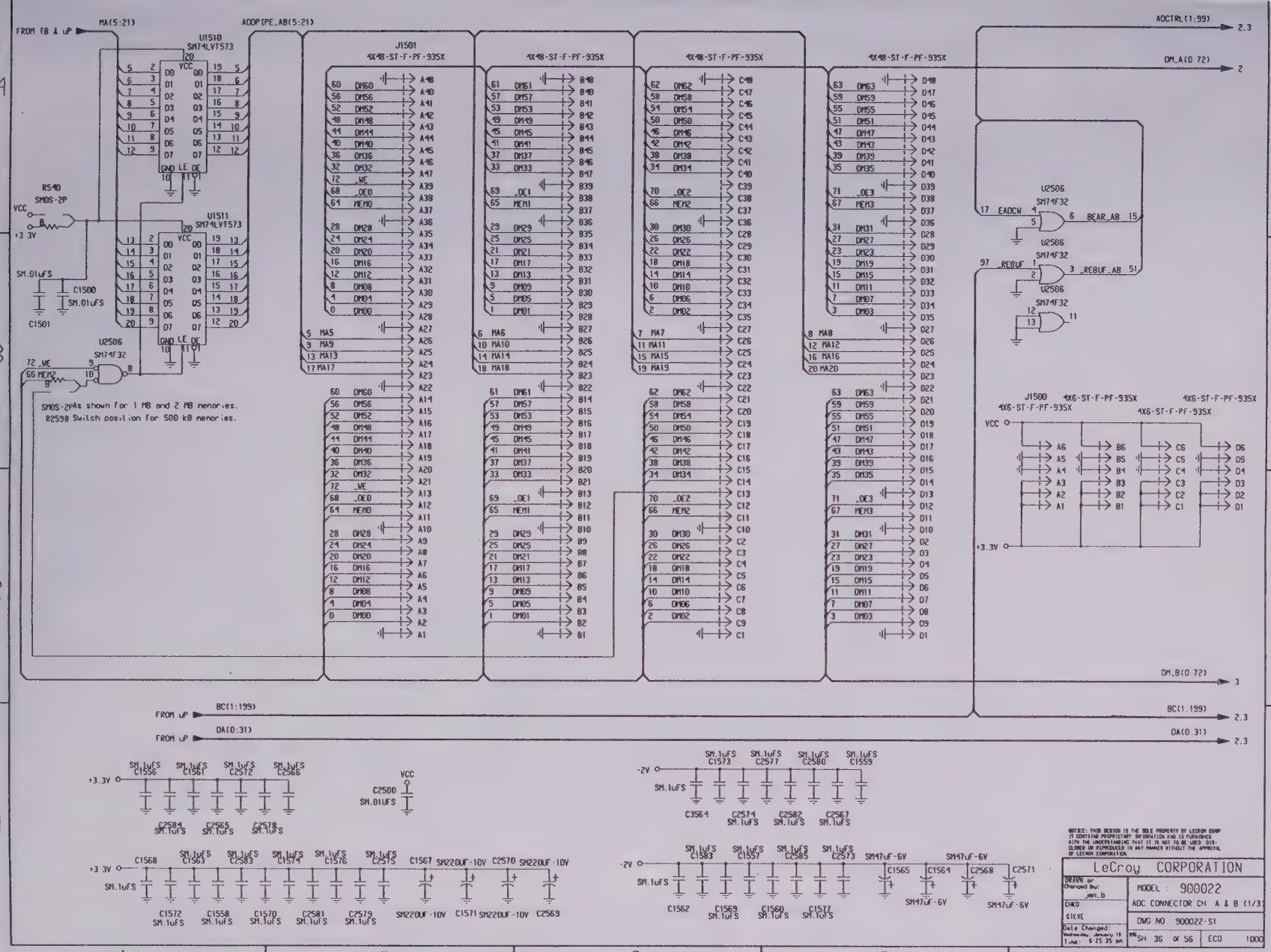

FROM uP DO(0:15)
FROM uP BUFA(1:17)
FROM uP MA(5.21)
FROM uP DA(0:31)
FROM TB & uP ADCTRL(1:99)
FROM uP BC(1:199)
FROM FC ADCIN(1:12)
SMA 9.5 INCHES SM_COAX_RG178B_U J100A
SMA 9.5 INCHES SM_COAX_RG178B_U J200A
U2524 SM10EL11
U2523 SM100EL56
4GS/s delay 250PS 1.32"
4GS/s Other
CLKDELAB H L
_CLKDELCD H H
ADC CONTROL A&B
ADC CONTROL C&D
ADC CONNECTOR A&B
ADC CONNECTOR C&D
ADD_A(0:31)
ADD_B(0:31)
ADD_C(0:31)
ADD_D(0:31)
VDELP(0:7)
SHCK_AB
SHCK_CD
_CLKDELAB
_CLKDELCD
Add this termination to the end of the line at channel
+12V_ADC
+5V_ADC
U2522 SMDAC8800
_RESET
_TRAD
SDWA
_SCKA
VOUTA
VOUTB
VOUTC
VOUTD
VOUTE
VOUTF
VOUTG
VOUTH
VDELP_XAA
VDELP_XAB
VDELP_XBA
VDELP_XBB
VDELP_XCA
VDELP_XCB
VDELP_XDA
VDELP_XDB
2x5-ST-M-NW-SP TP2500
U2507 SM74F139
_EADRH_A
_EADRH_B
_EADR_AB
_EADRH_C
_EADRH_D
_EADR_CD
SELBYT
DA22
MSH prop. delay -0.5V / +0.5V
LeCroy CORPORATION
MODEL : 900022
ADC (1/2)
DWG NO 900022-S1
SH 31 OF 56
ECO 1000


MSH power supply
ADC power supply
LeCroy CORPORATION
MODEL 900022
ADC (2/2)
DWG NO 900022-S1




U1503
HAD621A
ADCIN(1:12)
FROM FE
MSH input select
ADCTRL_A(0:2)
FROM ADCTRL_AB
MSH variable delay CTRL
+/- 120ps
MSH TRACK WIDTH
800PS 5*
ADC PULSE WIDTH
70//30// 600PS
3.9*
MSH to ADC delay
ADC to MDX delay
0.2nS (LENGTH) 8.0*
MSH to ADC delay trim
0 to 125ps
ADC power supply
TO ADC_CONNECTOR_AB
ADO_A(0:31)
FROM ADC_CONTROL_AB
LeCroy CORPORATION
MODEL : 900022
ADC CHANNEL A (1/1)
DWG NO 900022-S1
SH 34 OF 55
ECO 1000


LeCroy CORPORATION
MODEL : 900022
ADC CHANNEL B (1/1)
DWG NO 900022-S1
U2503
HAD621A
ADC power supply
TO ADC_CONNECTOR_AB
FROM ADC_CONTROL_AB
FROM FE
FROM ADC
MSH input select
MSH variable delay CTRL
+/- 120ps
MSH TRACK WIDTH
800PS 5"
ADC PULSE WIDTH
70/30% 600PS
3.5"
ADC to MUX delay
2nS (LENGTH) 8.0"
MSH to ADC delay
MSH to ADC delay trim
0 to 1250ps
Solder side
Conversion Edge
Track
Hold
SHCK
ADCT
SMLF347
SM10EL05
SM10EL11
SM10EL16
SM68.1S
SM200.05
SM182.05
SM121.05
SM150.05EE
SM1.1uFS
SM.01uFS
SM51.1S
SM75.05
SM68.2S
SM100.05
+12V_ADC
-12V_ADC
+5V_ADC
-4.5V_ADC
VEE
Vrm = VRB/2 + OFST1/2
A and B refer to the inputs
not the channel within the HAD621
Solder side



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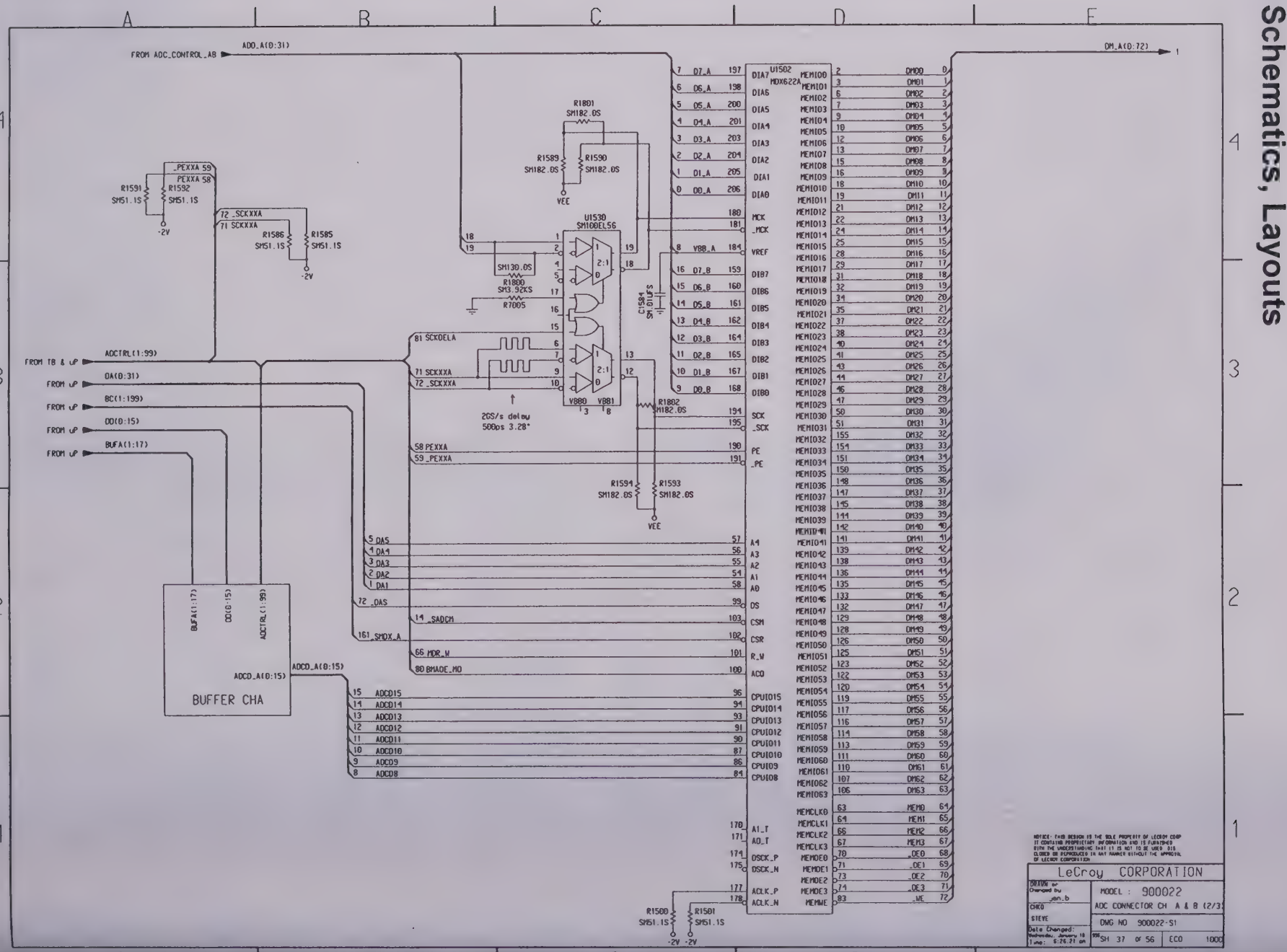
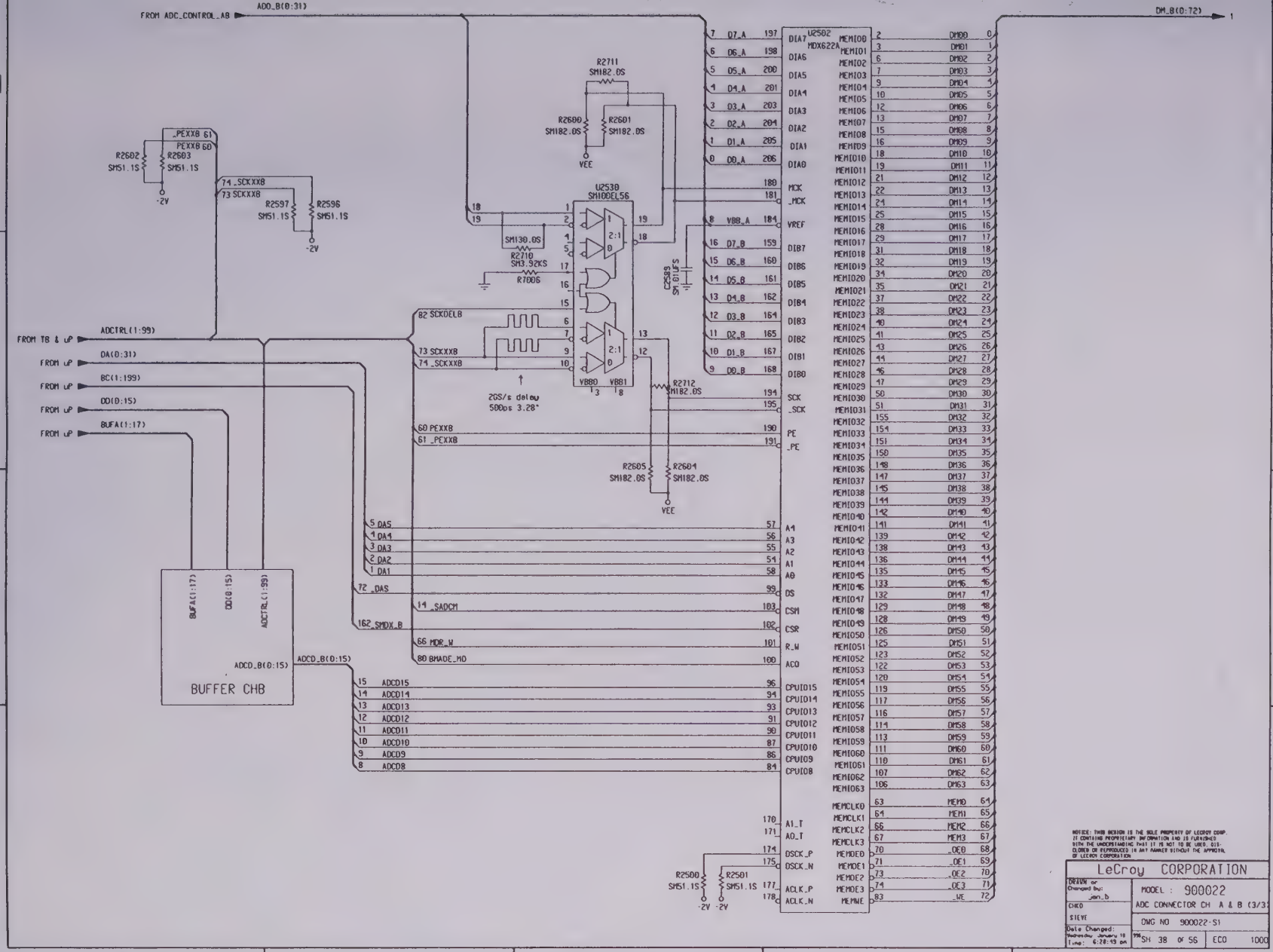
OF LECROY CORPORATION

LeCroy CORPORATION	
DRAWN or Changed by: jan_b	MODEL : 900022
CHKD STEVE	ADC CONNECTOR CH A & B (1/3)
Date Changed: Wednesday, January 18 time: 6:25:35 pm	DWG NO 900022-S1
	SH 36 OF 56 ECO 1000


FROM ADC_CONTROL_AB
ADO_A(0:31)
DM_A(0:72)
U1502
MDX622A
U1530
SM100EL56
R1801
SM182.0S
R1589
SM182.0S
R1590
SM182.0S
VEE
R1591
SM51.1S
R1592
SM51.1S
-2V
R1586
SM51.1S
R1585
SM51.1S
SM130.0S
R1800
SM3.92KS
R7005
C1584
SM 01UFS
R1802
SM182.0S
R1594
SM182.0S
R1593
SM182.0S
2GS/s delay
500ps 3.28"
FROM TB & UP
ADCTRL(1:99)
FROM UP
DA(0:31)
BC(1:199)
DD(0:15)
BUFA(1:17)
BUFFER CHA
ADCD_A(0:15)
R1500
SM51.1S
R1501
SM51.1S
LeCroy CORPORATION
MODEL : 900022
ADC CONNECTOR CH A & B (2/3)
DWG NO 900022-S1
SH 37 OF 56
ECO 1000


FROM ADC_CONTROL_AB
ADD_B(0:31)
DM_B(0:72)
R2711 SM182.0S
R2690 SM182.0S
R2691 SM182.0S
VEE
_PEXX8 61
PEXX8 60
R2602 SM51.1S
R2603 SM51.1S
-2V
74 _SCKXX8
73 SCKXX8
R2597 SM51.1S
R2596 SM51.1S
-2V
U2538 SM10DEL56
SM130.0S
R2710 SM3.92KS
R7006
C2589 SM.01UFS
82 SCKDELB
73 SCKXX8
74 _SCKXX8
VB80 VB81
2GS/s delay 500ps 3.28"
R2712 SM182.0S
R2605 SM182.0S
R2604 SM182.0S
VEE
FROM TB & uP
ADCTRL(1:99)
FROM uP
DA(0:31)
FROM uP
BC(1:199)
FROM uP
DD(0:15)
FROM uP
BUFA(1:17)
BUFFER CHB
BUFA(1:17)
DD(0:15)
ADCTRL(1:99)
ADCD_B(0:15)
ADCD_B(0:15)
U2502 MDX622A
DIA7
DIA6
DIA5
DIA4
DIA3
DIA2
DIA1
DIA0
MCK
_MCK
VREF
DIB7
DIB6
DIB5
DIB4
DIB3
DIB2
DIB1
DIB0
SCK
_SCK
PE
_PE
A4
A3
A2
A1
A0
DS
CSM
CSR
R_W
ACO
CPUID15
CPUID14
CPUID13
CPUID12
CPUID11
CPUID10
CPUID09
CPUID08
A1_T
A0_T
OSCK_P
OSCK_N
ACLK_P
ACLK_N
MEMIO00
MEMIO01
MEMIO02
MEMIO03
MEMIO04
MEMIO05
MEMIO06
MEMIO07
MEMIO08
MEMIO09
MEMIO10
MEMIO11
MEMIO12
MEMIO13
MEMIO14
MEMIO15
MEMIO16
MEMIO17
MEMIO18
MEMIO19
MEMIO20
MEMIO21
MEMIO22
MEMIO23
MEMIO24
MEMIO25
MEMIO26
MEMIO27
MEMIO28
MEMIO29
MEMIO30
MEMIO31
MEMIO32
MEMIO33
MEMIO34
MEMIO35
MEMIO36
MEMIO37
MEMIO38
MEMIO39
MEMIO40
MEMIO41
MEMIO42
MEMIO43
MEMIO44
MEMIO45
MEMIO46
MEMIO47
MEMIO48
MEMIO49
MEMIO50
MEMIO51
MEMIO52
MEMIO53
MEMIO54
MEMIO55
MEMIO56
MEMIO57
MEMIO58
MEMIO59
MEMIO60
MEMIO61
MEMIO62
MEMIO63
MEMCLK0
MEMCLK1
MEMCLK2
MEMCLK3
MEMDE0
MEMDE1
MEMDE2
MEMDE3
MEMWE
R2500 SM51.1S
R2501 SM51.1S
-2V -2V
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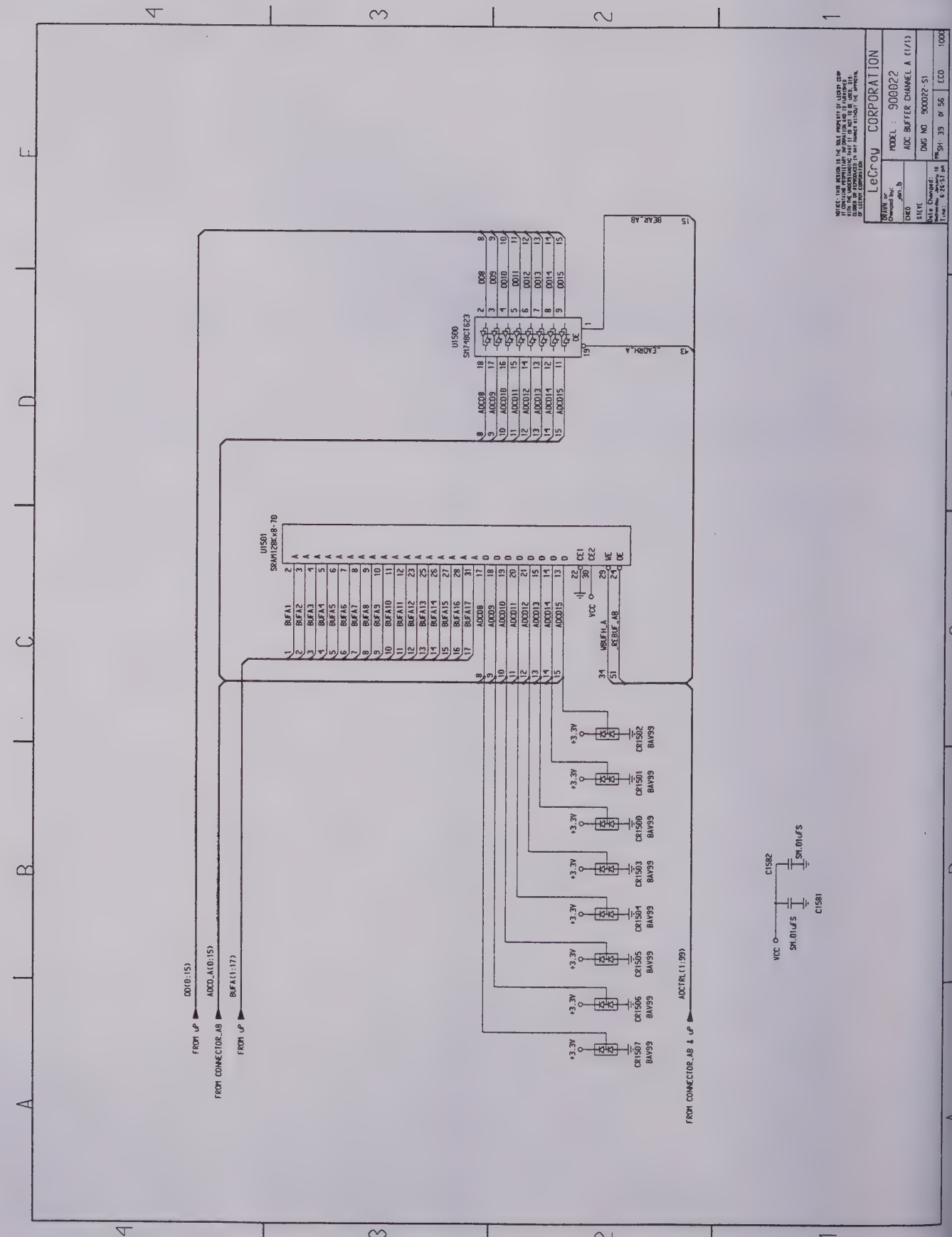
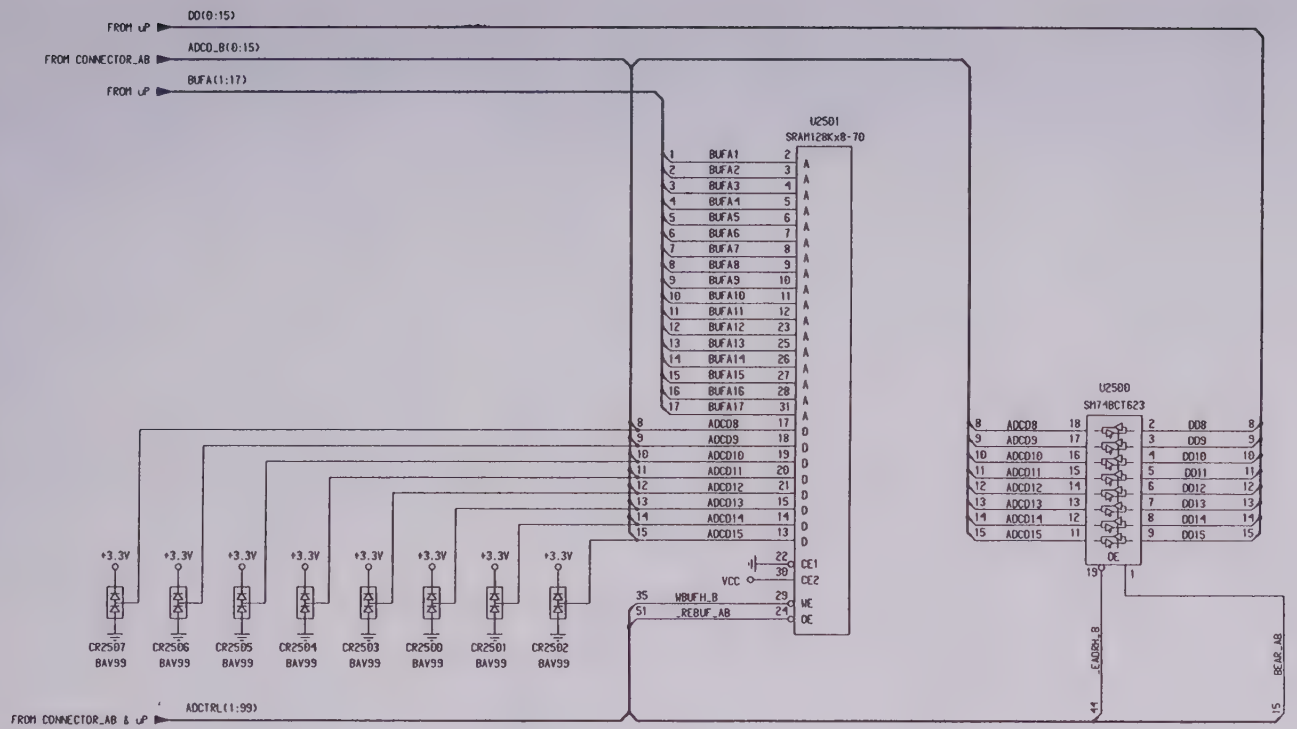
LeCroy CORPORATION
DRAWN or Changed by: _jon_b
CHKD STEVE
Date Changed: Wednesday, January 10 Time: 6:28:43 pm
MODEL : 900022
ADC CONNECTOR CH A & B (3/3)
DWG NO 900022-S1
SH 38 OF 56
ECO 1000


LeCroy CORPORATION
MODEL : 900022
ADC BUFFER CHANNEL A (1/1)
DWG NO 900022-S1
SH: 39 OF 56
ECO 1000
U1500
SN74BCT623
U1501
SRAM128Kx8-70
FROM uP
FROM CONNECTOR_AB
FROM uP
FROM CONNECTOR_AB & uP
CR1502 BAV99
CR1501 BAV99
CR1500 BAV99
CR1503 BAV99
CR1504 BAV99
CR1505 BAV99
CR1506 BAV99
CR1507 BAV99
C1582
C1581
SM.01uFS
VCC



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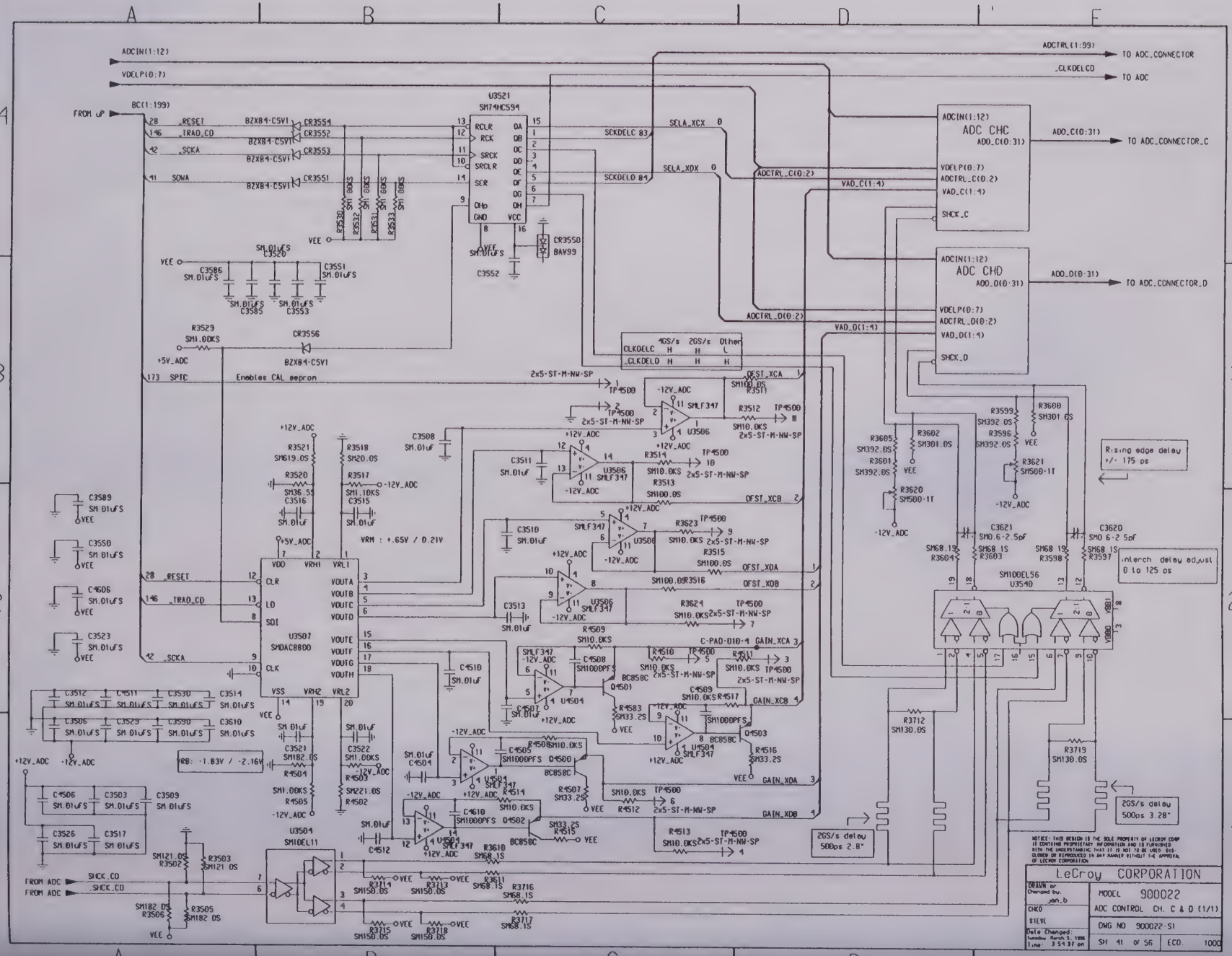
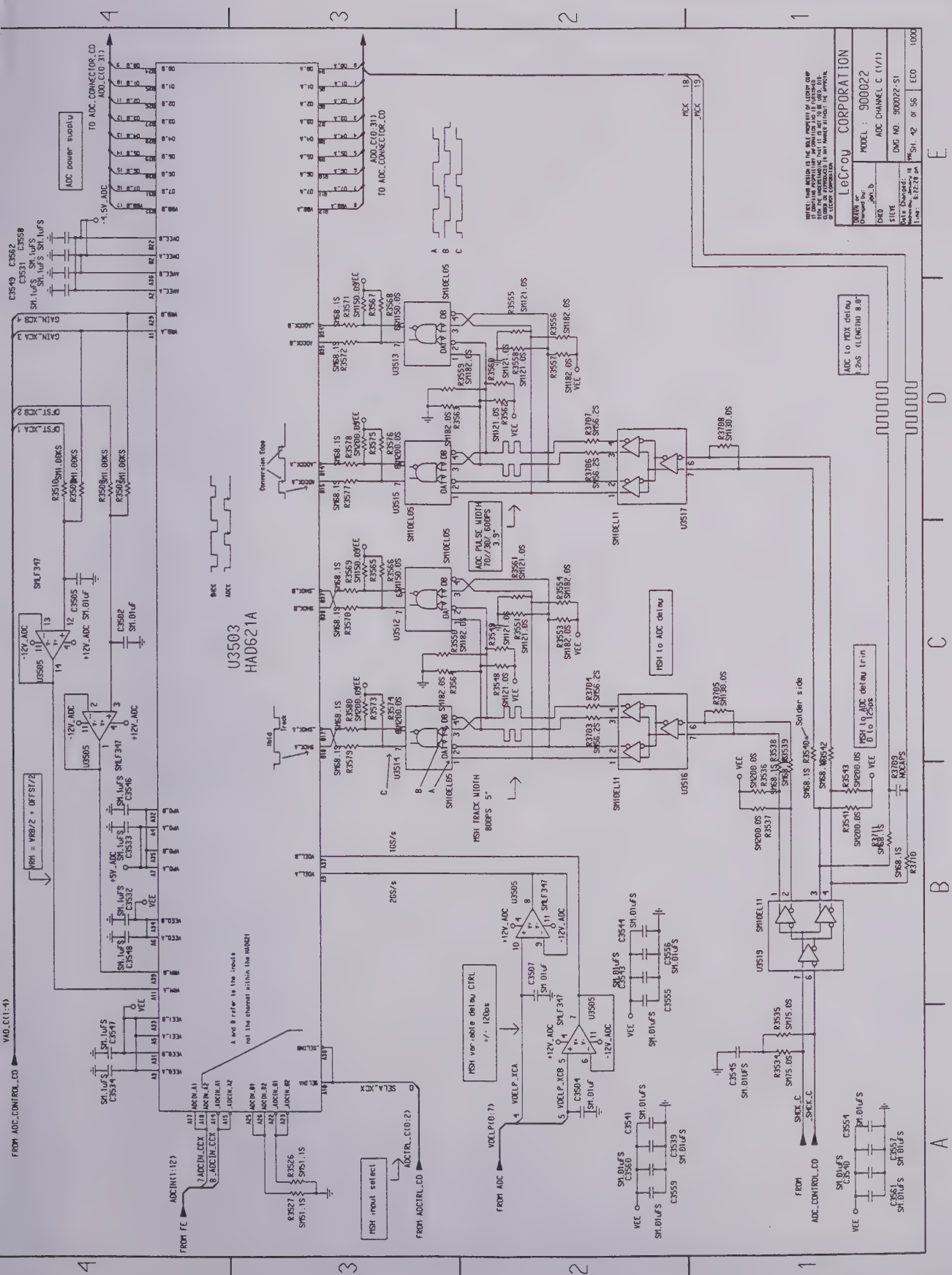
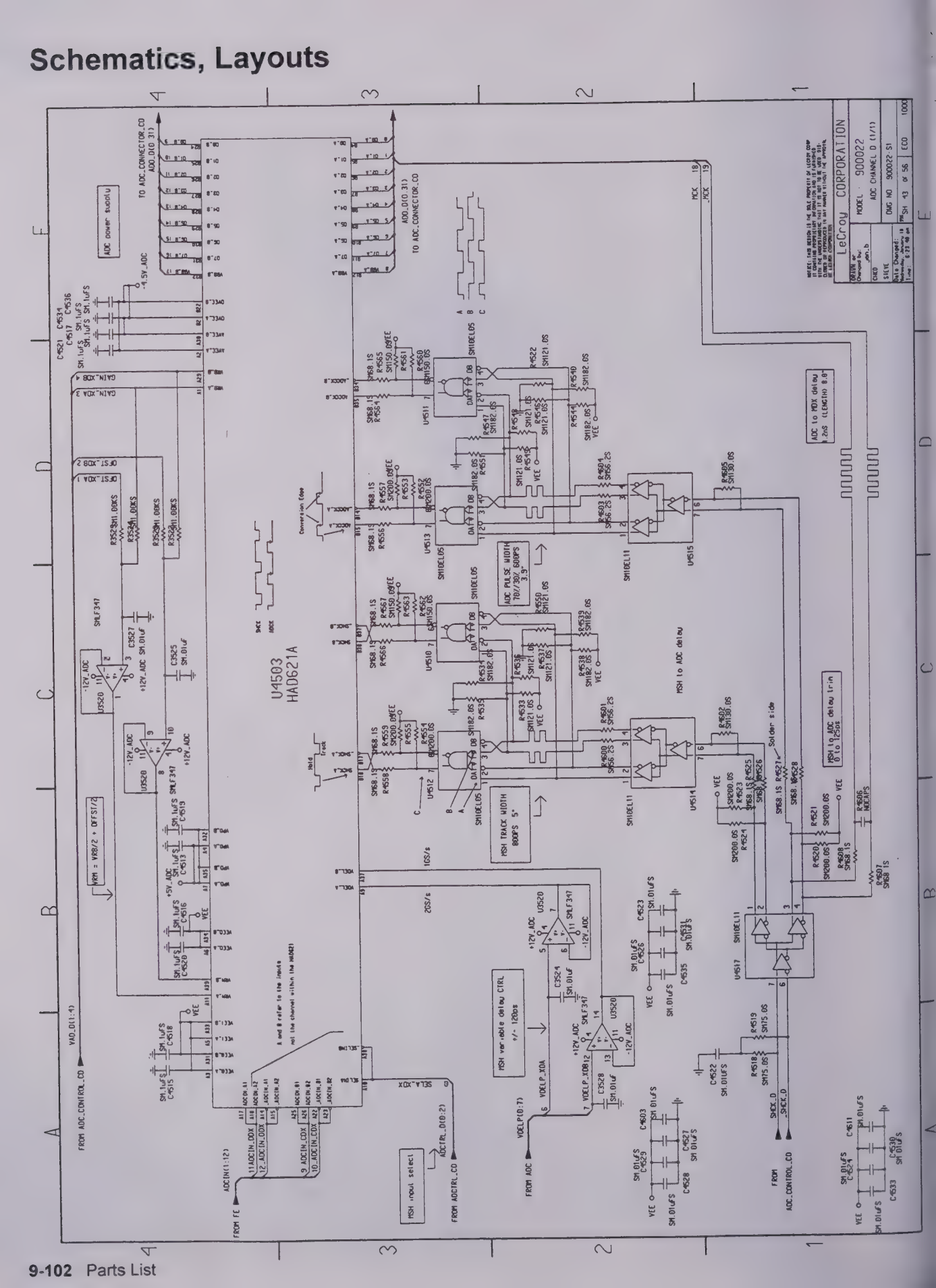
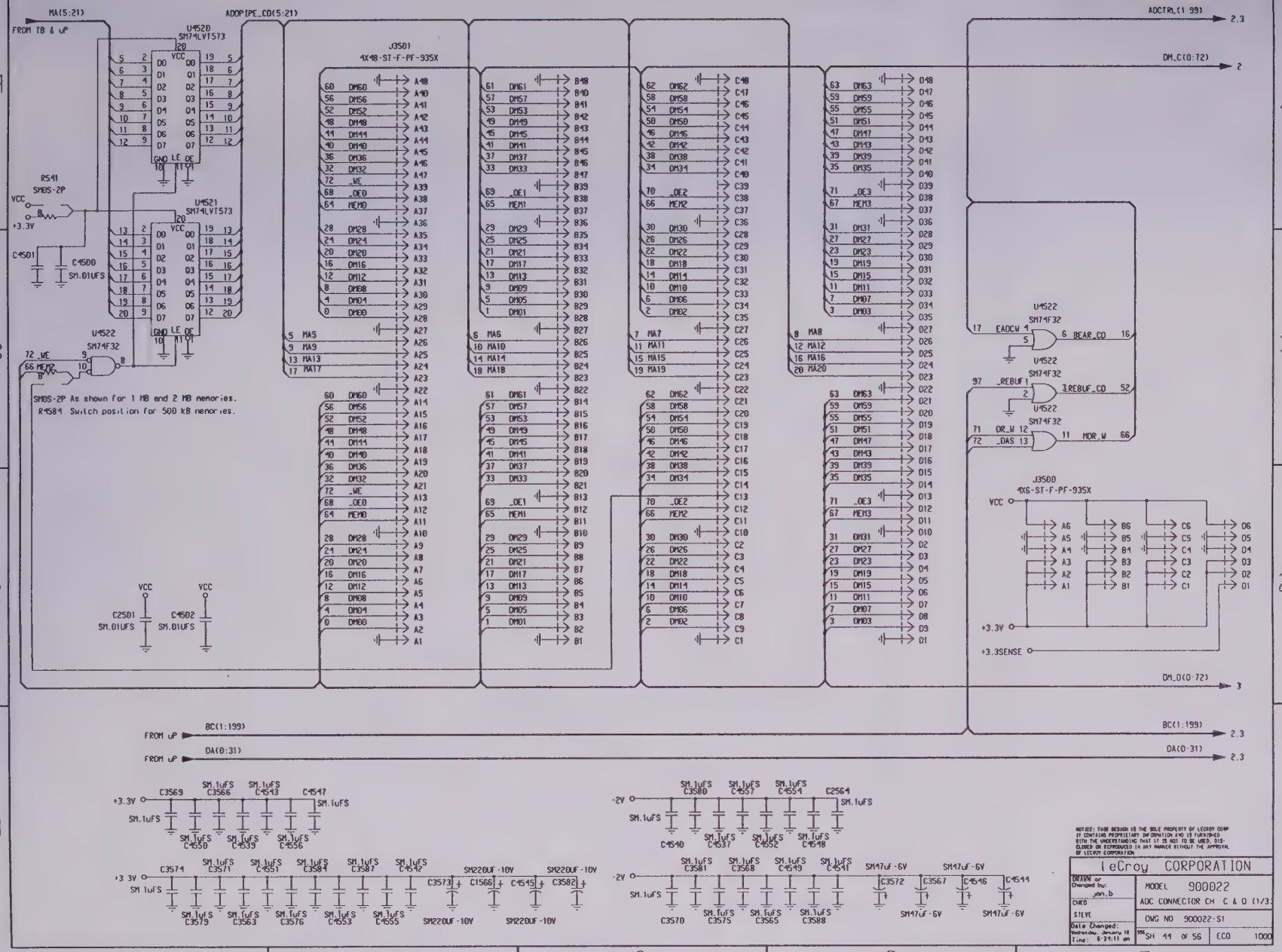
LeCroy CORPORATION	
DRAWN or Changed by: _ian_b	MODEL : 9384-3
CHKD: STEVE	ADC BUFFER CHANNEL B (1/1)
Date Changed: Wednesday, January 10 Time: 6:29:31 pm	DWG NO SCHEMA-9384-3
	SH 40 OF 56 ECO 1300


ADCIN(1:12)
VDELP(0:7)
BC(1:199)
FROM uP
ADCTRL(1:99)
TO ADC_CONNECTOR
_CLKDELCD
TO ADC
U3521
SM74HCS94
SCKDELC 83
SCKDELD 84
SELA_XCX
SELA_XDX
ADC CHC
ADC CHD
ADD_C(0:31)
ADD_D(0:31)
TO ADC_CONNECTOR_C
TO ADC_CONNECTOR_D
ADCTRL_C(0:2)
ADCTRL_D(0:2)
VAD_C(1:4)
VAD_D(1:4)
SHCK_C
SHCK_D
CLKDELC H H L
CLKDELD H H H
Enables CAL eeprom
U3507
SMDAC8800
U3504
SM10EL11
U3540
SM100EL56
Rising edge delay
+/- 175 ps
Interch delay adjust
0 to 125 ps
2GS/s delay
500ps 2.8"
2GS/s delay
500ps 3.28"
VRM : +.65V / 0.21V
VRB: -1.83V / -2.16V
LeCroy CORPORATION
MODEL 900022
ADC CONTROL CH. C & D (1/1)
DWG NO 900022-S1
SH 41 OF 56
ECO. 1000


LeCroy CORPORATION
MODEL : 900022
ADC CHANNEL C (1/1)
DWG NO. 900022-S1
SH. 42 OF 56
ECO
U3503
HAD621A
ADC power supply
TO ADC_CONNECTOR_CD
ADC PULSE WIDTH
MSH TRACK WIDTH
MSH to ADC delay
ADC to MDX delay
MSH to ADC delay trim
MSH variable delay CTRL
MSH input select
FROM ADC_CONTROL_CD
FROM ADC
FROM FE
FROM ADCTRL_CD
Solder side
Conversion Edge
Hold Track


U4503
HAD621A
LeCroy CORPORATION
MODEL 900022
ADC CHANNEL D (1/1)
DWG NO 900022-S1
SH 43 of 56
ECO 1000
ADC power supply
TO ADC_CONNECTOR.CD
FROM ADC_CONTROL.CD
FROM FE
FROM ADC
MSH trace width 800PS 5"
MSH variable delay CTRL +/- 120ps
MSH input select
ADC PULSE WIDTH 70/380/ 800PS 3.9"
ADC to MUX delay 1.2nS (LENGTH) 8.0"
MSH to ADC delay
MSH to ADC delay trim 0 to 125ps
Solder side



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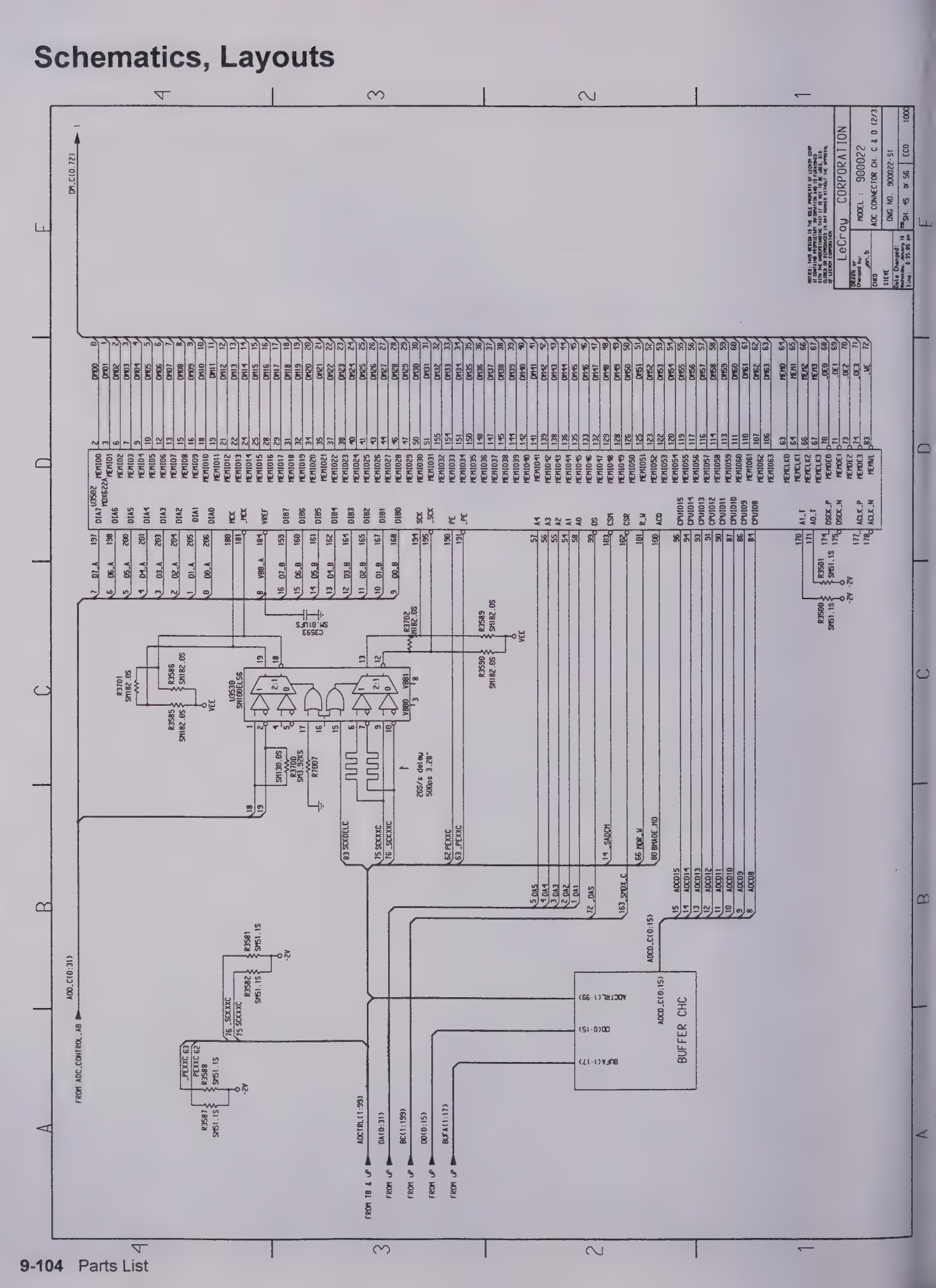
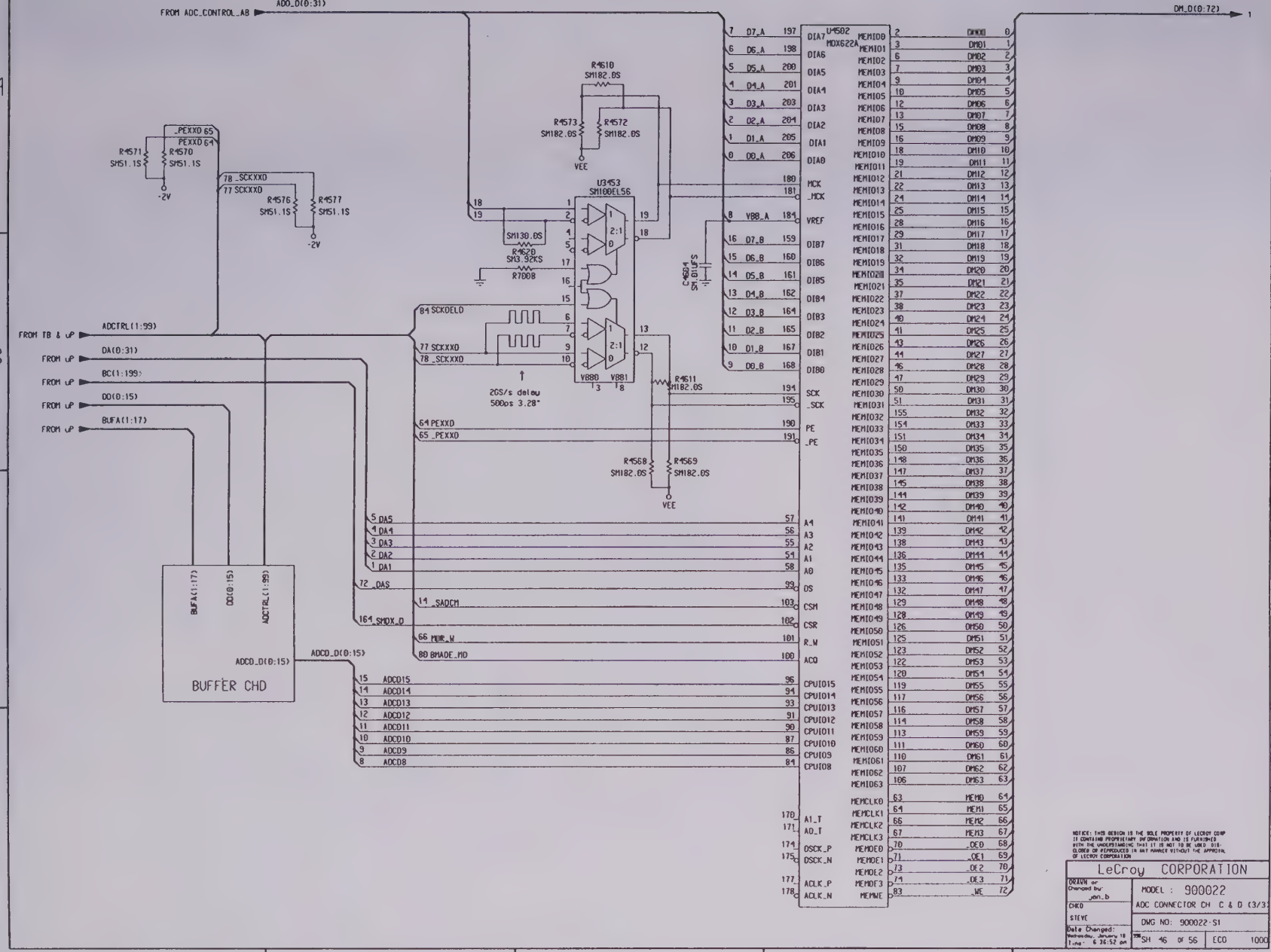

LeCroy CORPORATION
MODEL : 900022
AOC CONNECTOR CH. C & D (2/3)
DWG NO. 900022-51
SH 45 OF 56
ECO 1000
BUFFER CHC
ADCTRL(1:99)
DA(0:31)
BC(1:199)
DD(0:15)
BUFA(1:17)
ADCD_C(0:15)
FROM ADC_CONTROL_AB
ADD_C(0:31)
DM_C(0:72)
U0502 MD8622A
U0530 SN100ELS6
CS393 .01UF5
R3701 SN182.0S
R3586 SN182.0S
R3585 SN182.0S
R3702 SN182.0S
R3589 SN182.0S
R3590 SN182.0S
R3588 SN51.1S
R3587 SN51.1S
R3582 SN51.1S
R3581 SN51.1S
R3501 SN51.1S
R3500 SN51.1S
R7130 SN3.92KS
R7067
SN130.0S
-2V
VEE
20S/s delay
500ps 3.28*



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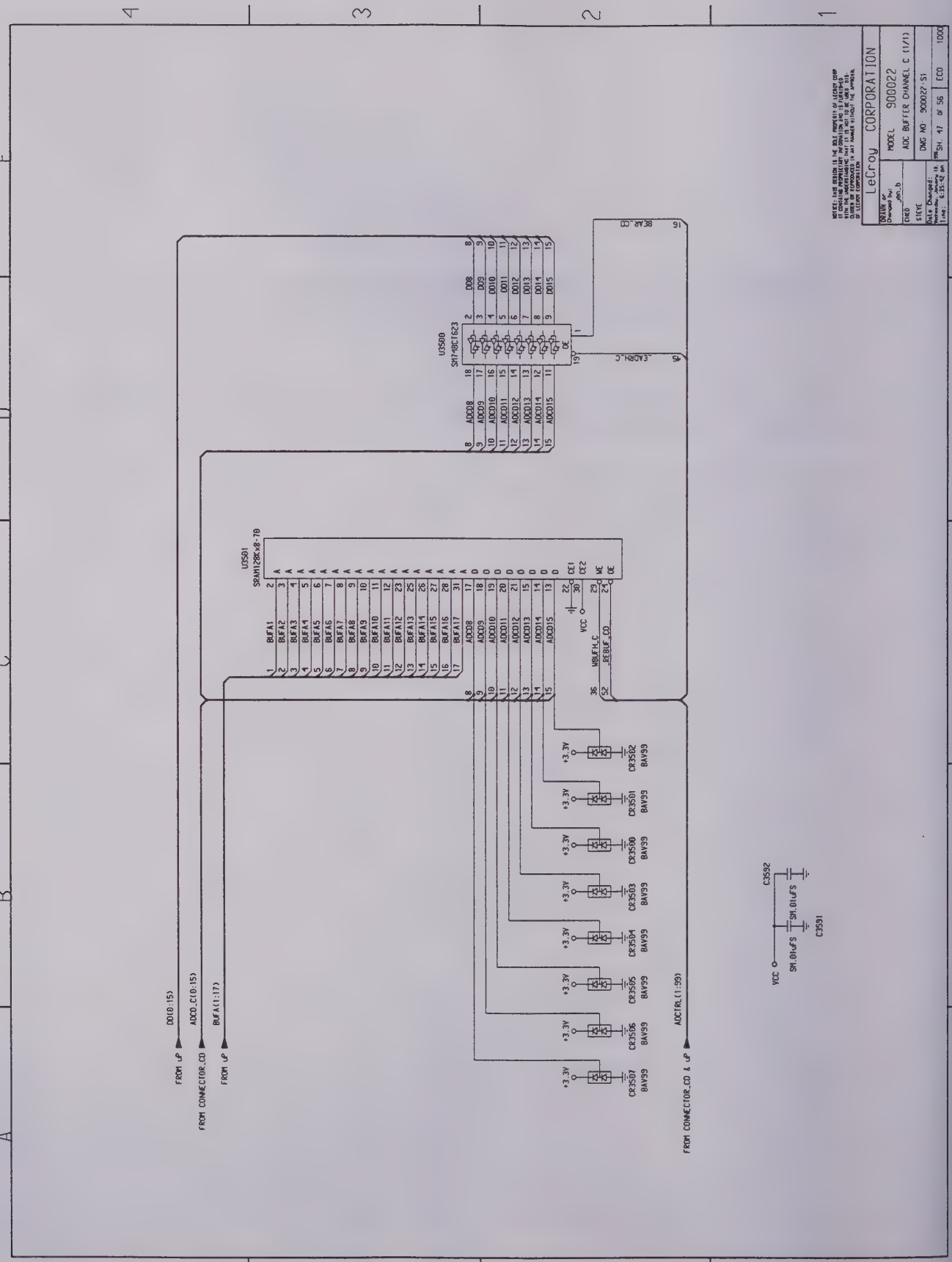
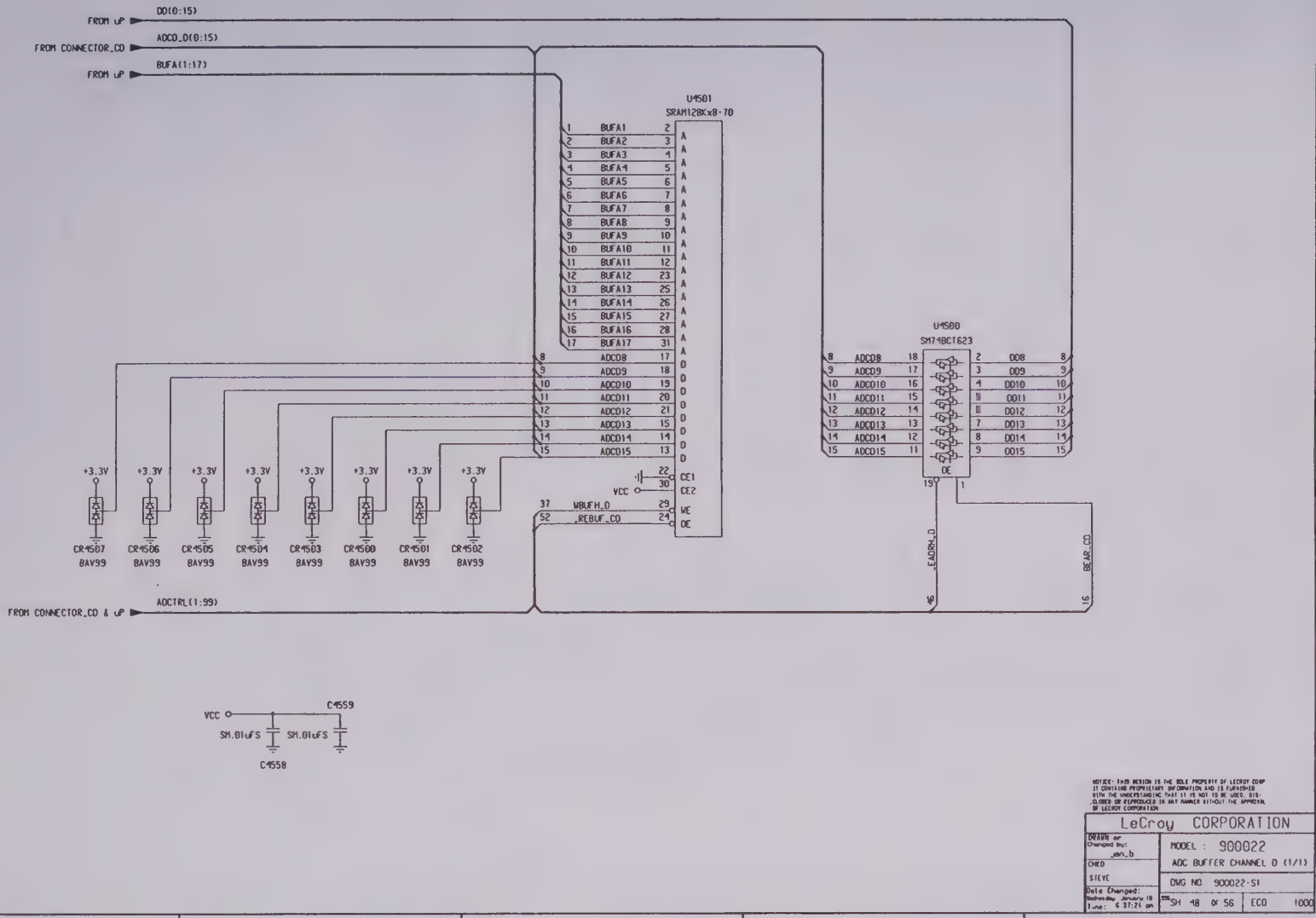

LeCroy CORPORATION
MODEL 900022
ADC BUFFER CHANNEL C (1/1)
DWG NO: 900022-S1
Sh. 47 of 56
ECO 1000
U3500
SN74BCT623
U3501
SRAM128K:8-70
BUFA1
BUFA2
BUFA3
BUFA4
BUFA5
BUFA6
BUFA7
BUFA8
BUFA9
BUFA10
BUFA11
BUFA12
BUFA13
BUFA14
BUFA15
BUFA16
BUFA17
ADCD8
ADCD9
ADCD10
ADCD11
ADCD12
ADCD13
ADCD14
ADCD15
D8
D9
D10
D11
D12
D13
D14
D15
OE
CE1
CE2
WE
VCC
VBUFA_C
ACBUF_CD
BCAP
C3592
C3591
SN.01uFS
VCC
CR3500
CR3501
CR3502
CR3503
CR3504
CR3505
CR3506
CR3507
BAV99
+3.3V
D(0:15)
ADCD_C(0:15)
BUFA(1:17)
ADCTRL(1:39)
FROM UP
FROM CONNECTOR_CD
FROM CONNECTOR_CD & UP


DD(0:15)
FROM uP
ADCO_D(0:15)
FROM CONNECTOR_CD
BUFA(1:17)
FROM uP
U4501
SRAM128Kx8-70
BUFA1
BUFA2
BUFA3
BUFA4
BUFA5
BUFA6
BUFA7
BUFA8
BUFA9
BUFA10
BUFA11
BUFA12
BUFA13
BUFA14
BUFA15
BUFA16
BUFA17
ADCD8
ADCD9
ADCD10
ADCD11
ADCD12
ADCD13
ADCD14
ADCD15
CE1
CE2
WE
OE
VCC
WBUFH_D
_REBUF_CD
U4500
SM74BCT623
DD8
DD9
DD10
DD11
DD12
DD13
DD14
DD15
OE
_EADRH_D
_BEAR_CD
+3.3V
CR4507 BAV99
CR4506 BAV99
CR4505 BAV99
CR4504 BAV99
CR4503 BAV99
CR4500 BAV99
CR4501 BAV99
CR4502 BAV99
ADCTRL(1:99)
FROM CONNECTOR_CD & uP
VCC
C4559
SM.01uFS
SM.01uFS
C4558
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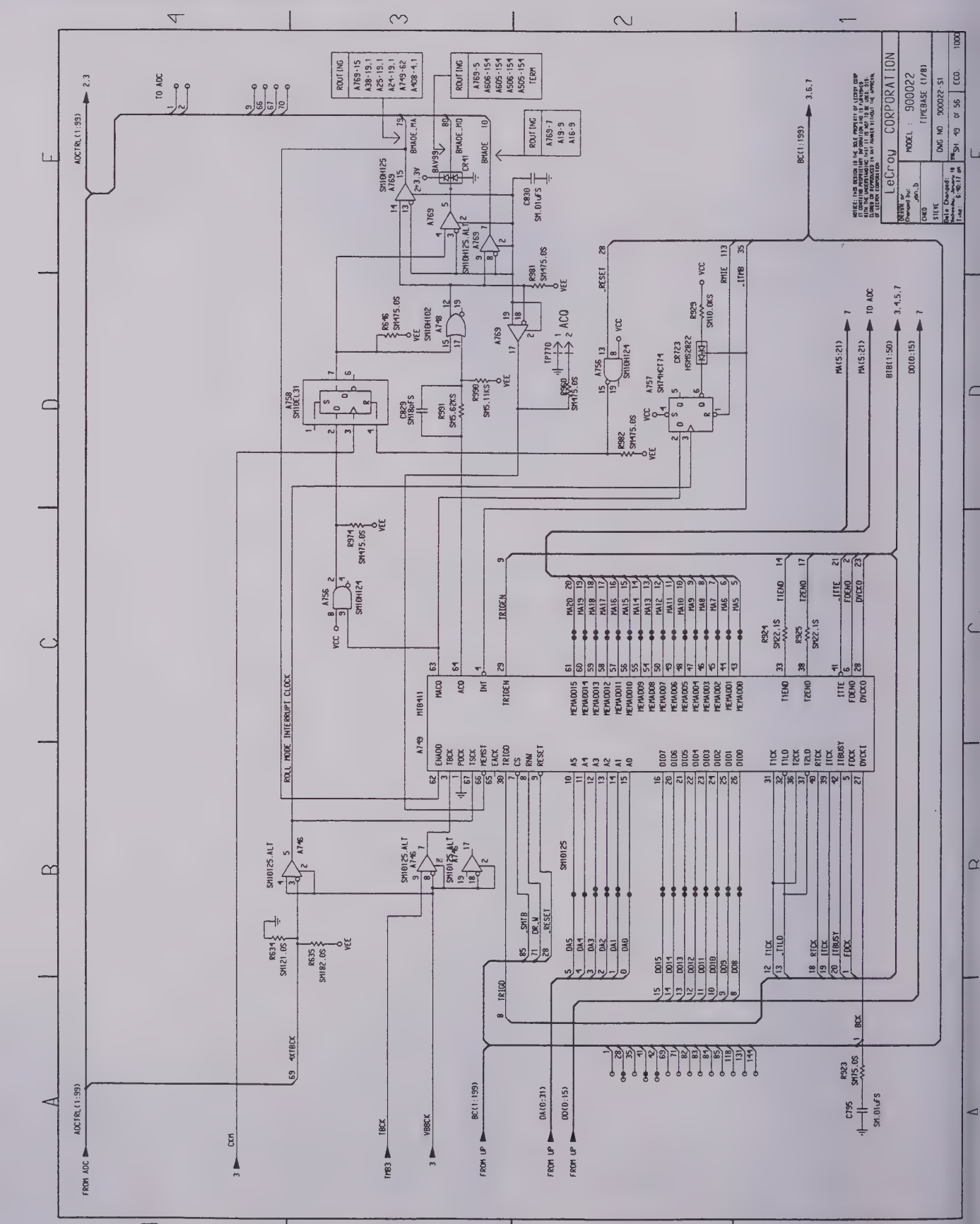
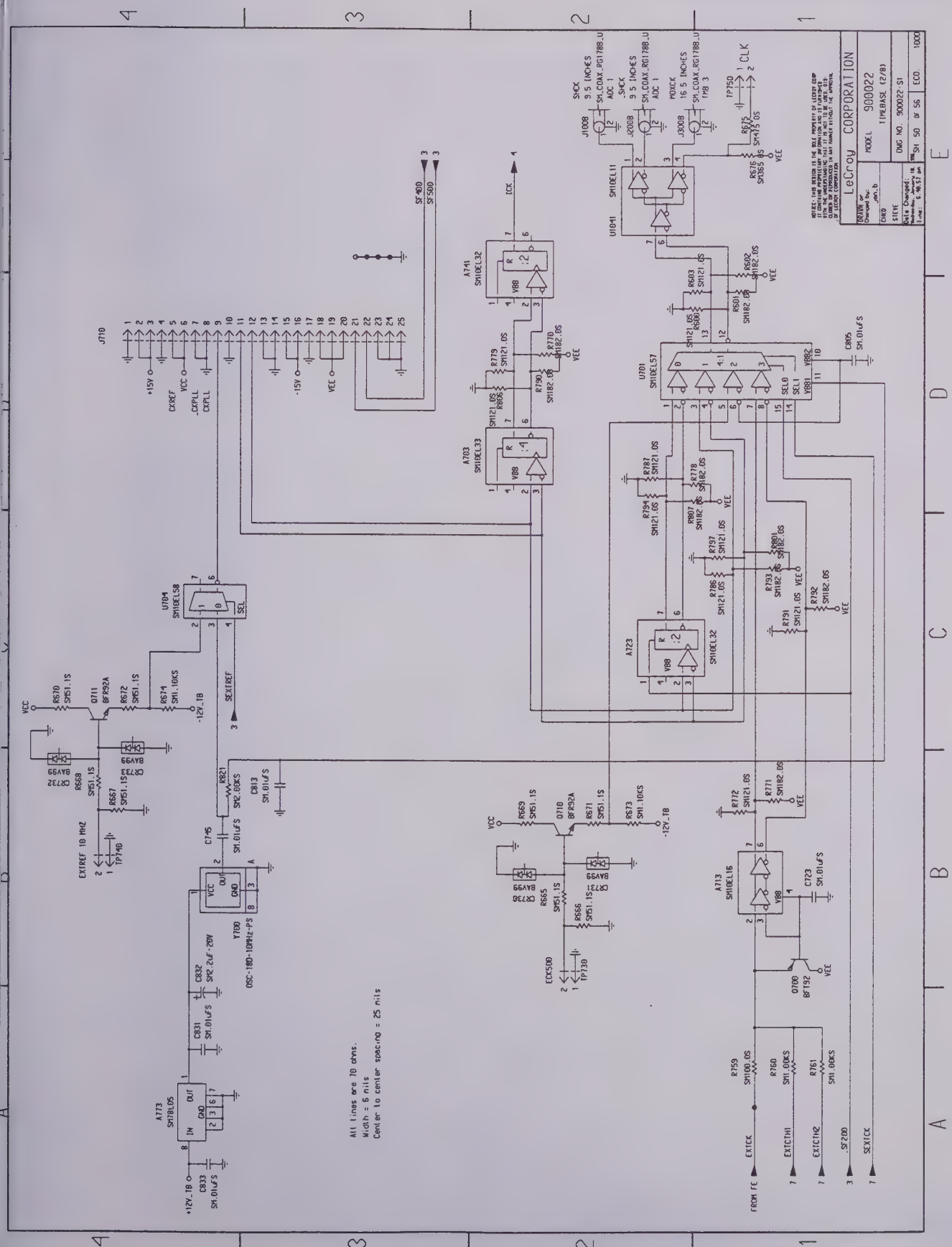
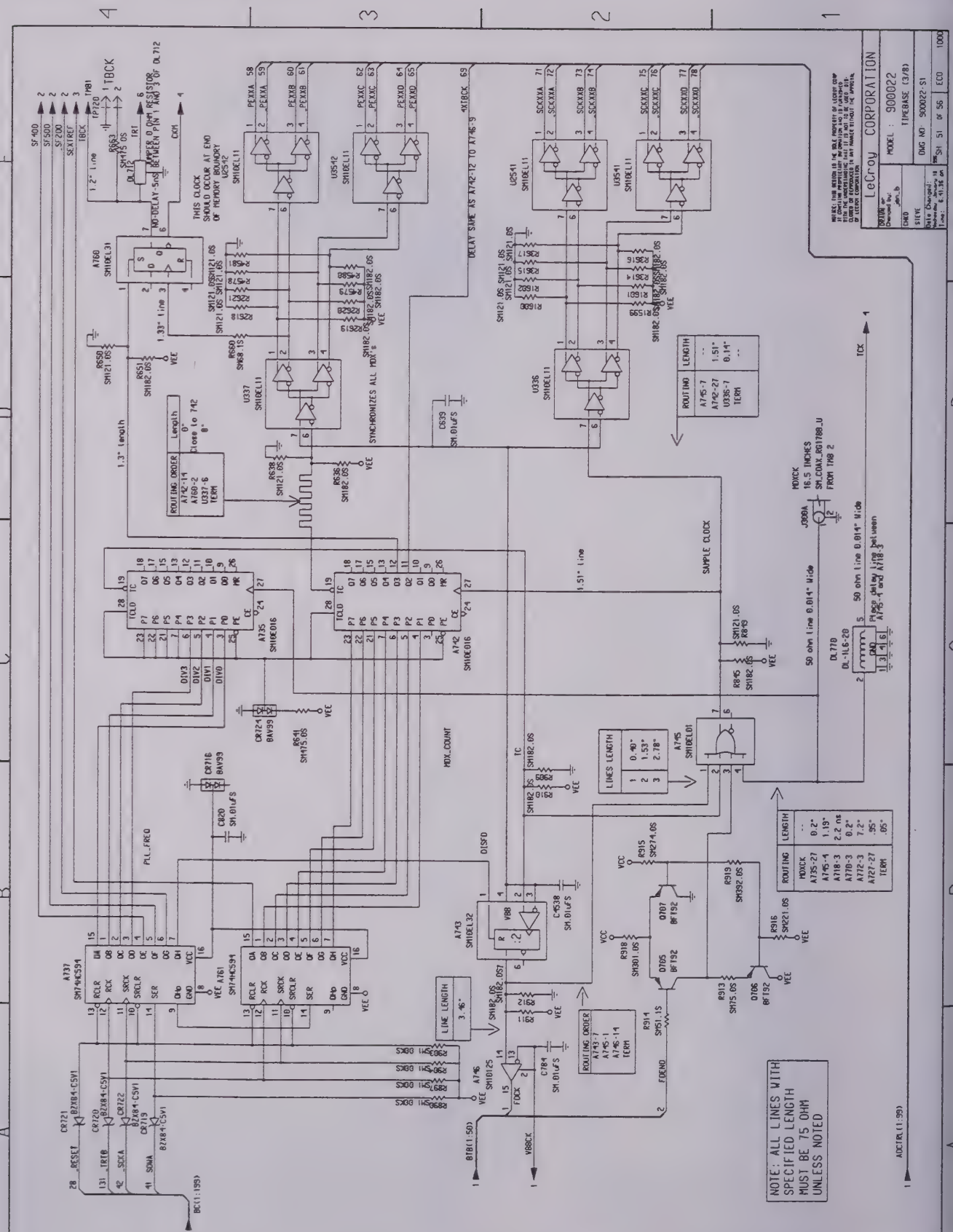
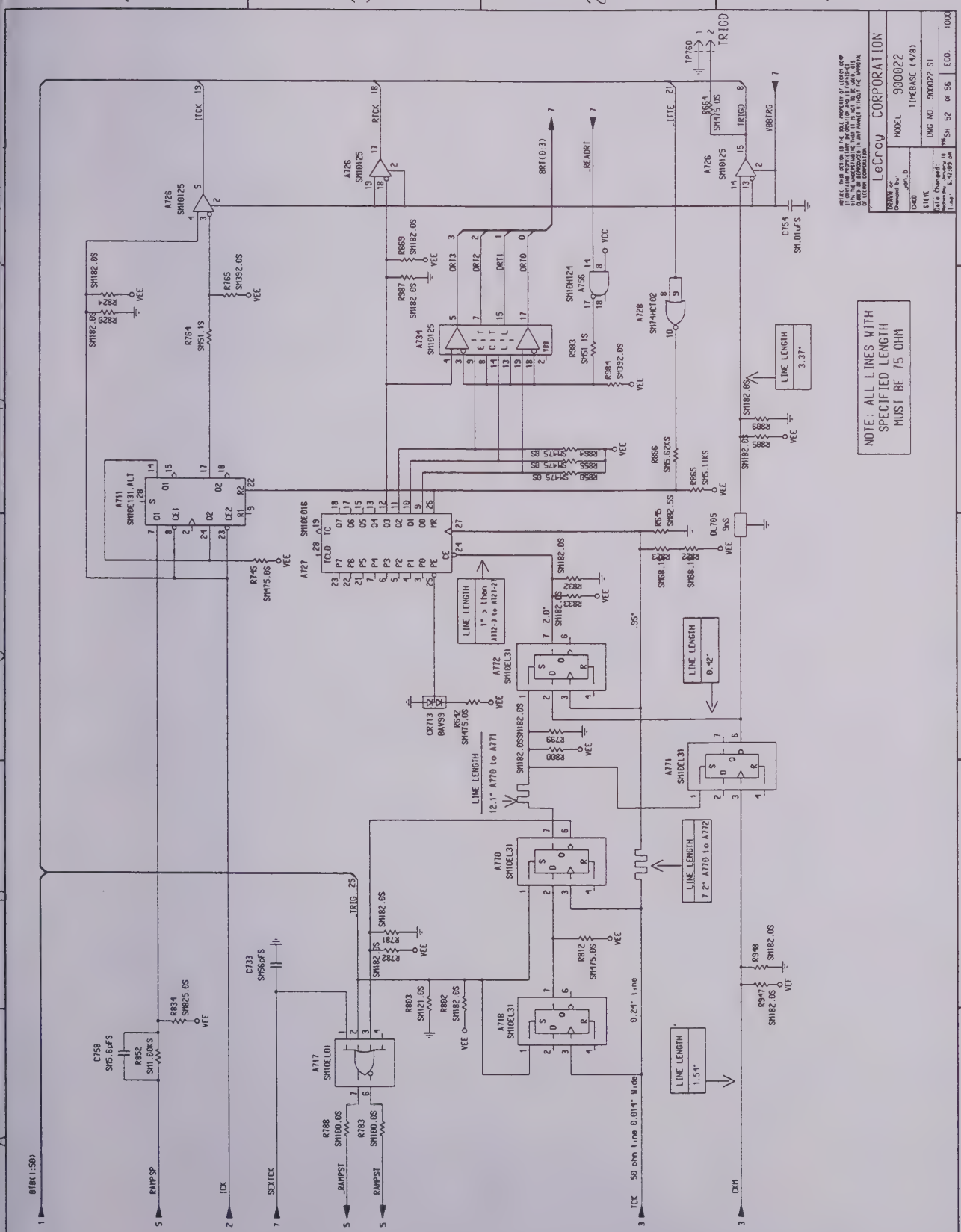
OF LECROY CORPORATION
LeCroy CORPORATION
DRAWN or Changed by: _jan_b
CHKD
STEVE
Date Changed: Wednesday, January 10
Time: 6:37:21 pm
MODEL : 900022
ADC BUFFER CHANNEL D (1/1)
DWG NO 900022-S1
SH 18 OF 56
ECO 1000

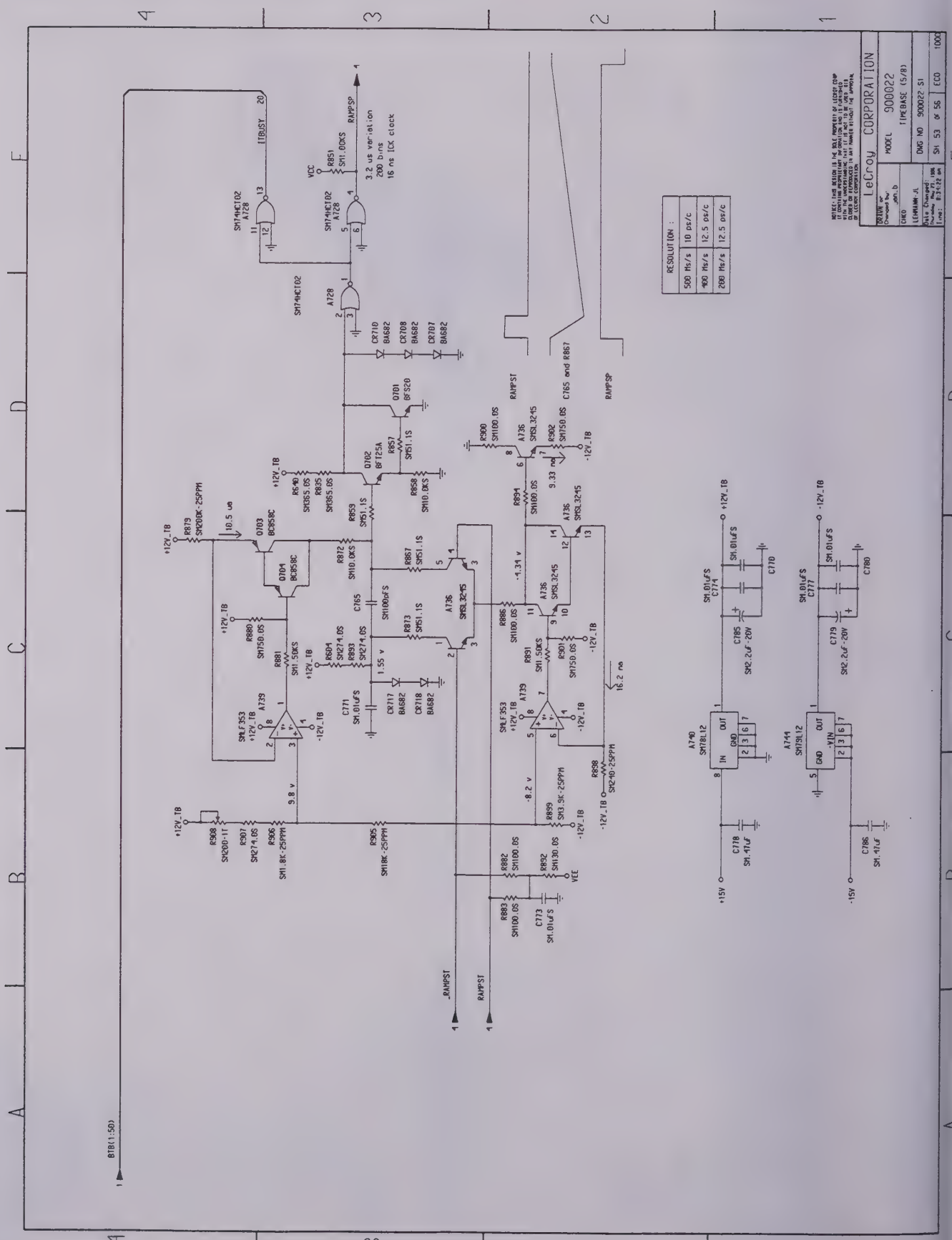
Schematics, Layouts

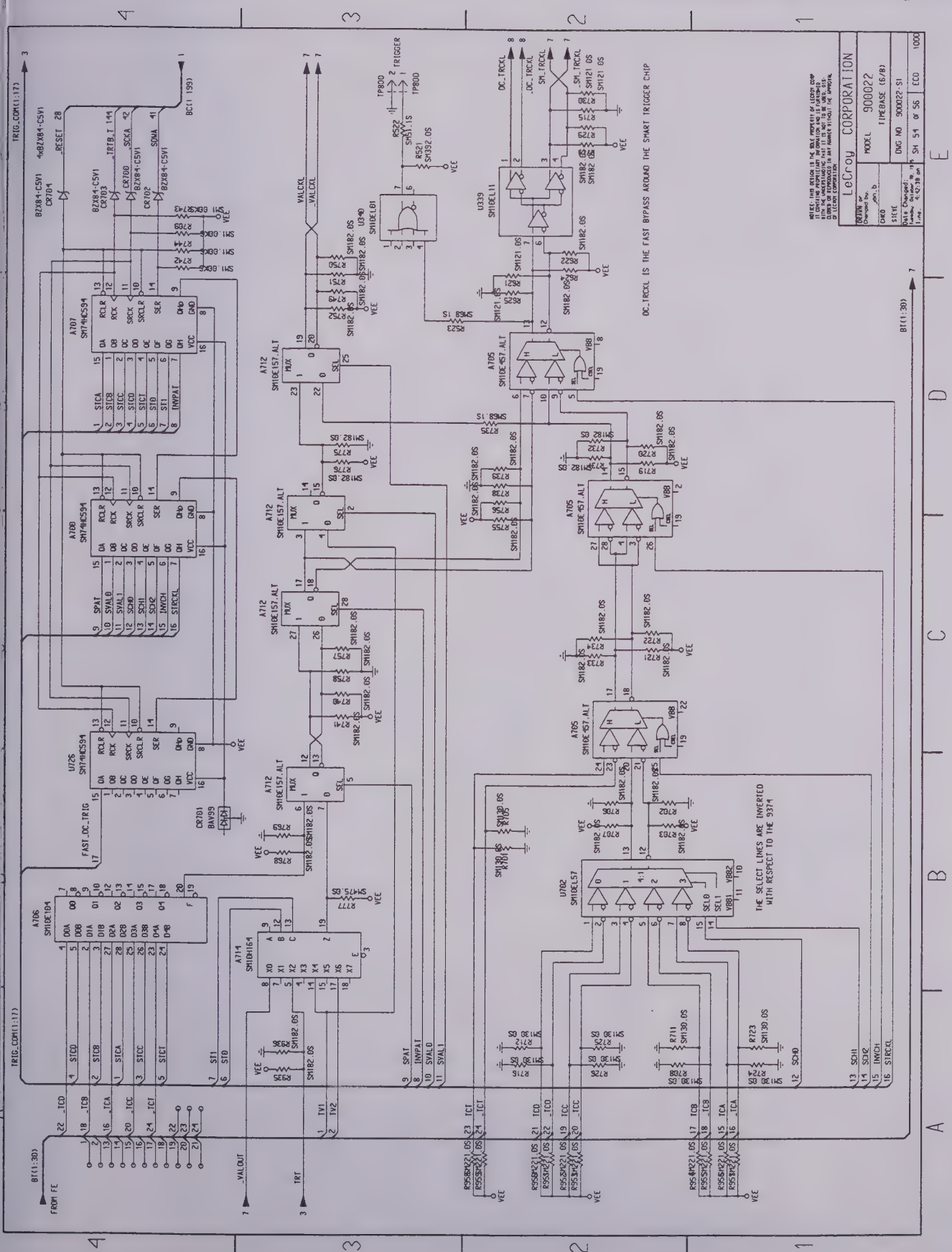


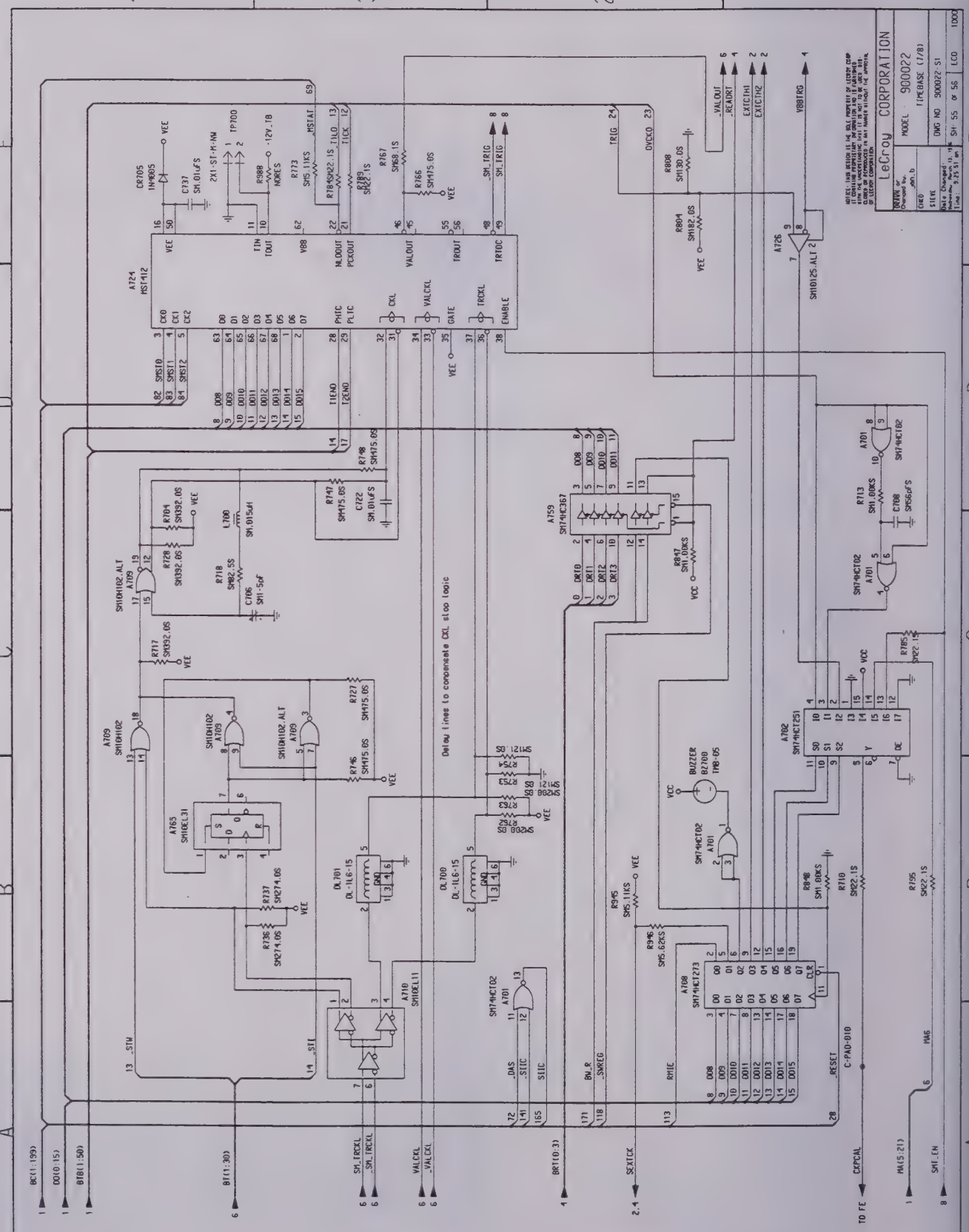

LeCroy CORPORATION
MODEL 900022
TIMEBASE (2/8)
DWG NO. 900022-S1
SH 50 OF 56
ECO 1000
All lines are 70 ohms.
Width = 6 mils
Center to center spacing = 25 mils

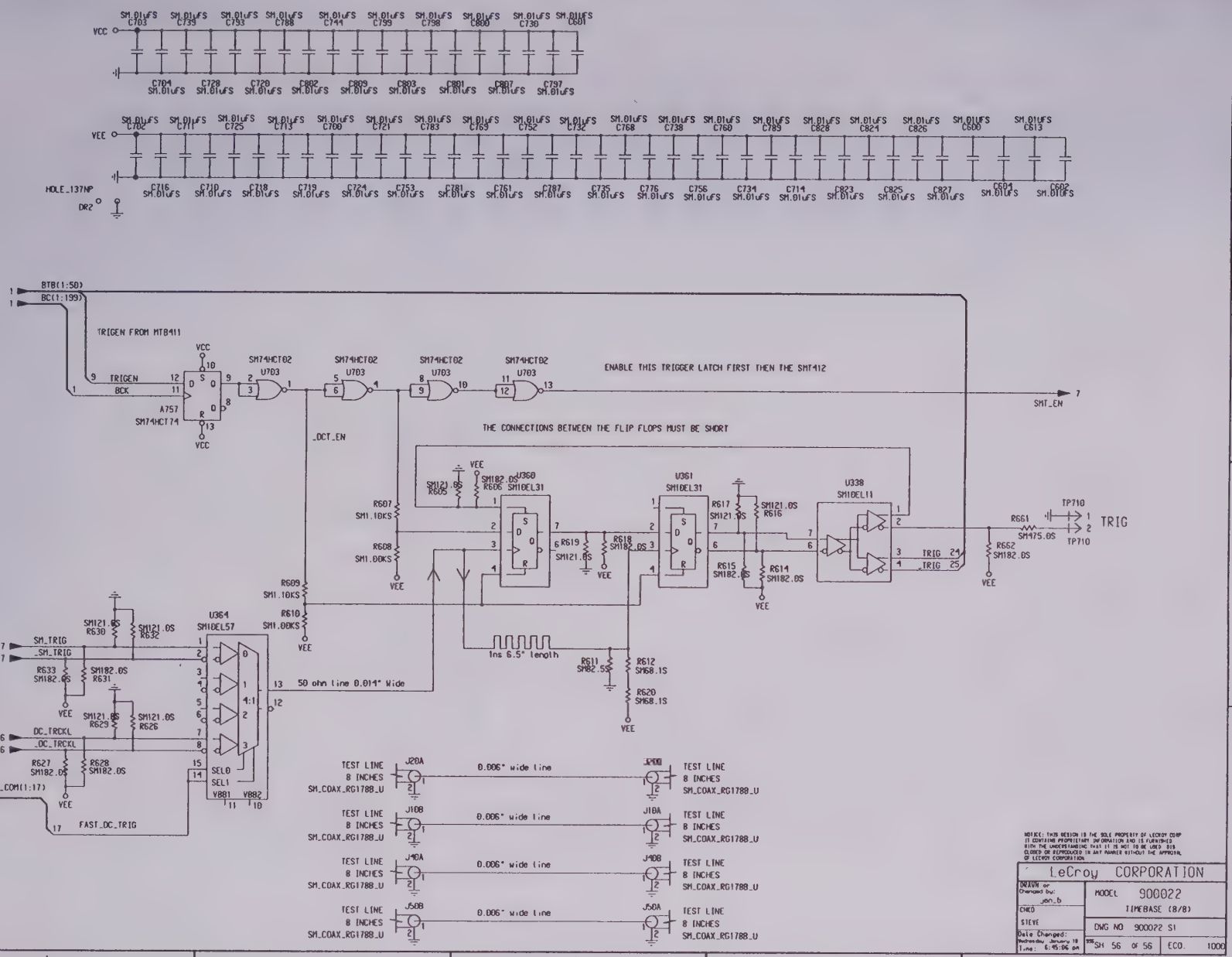

LeCroy CORPORATION
MODEL : 900022
TIMEBASE (3/8)
DWG NO 900022 S1
NOTE: ALL LINES WITH SPECIFIED LENGTH MUST BE 75 OHM UNLESS NOTED
SAMPLE CLOCK
MDX_COUNT
PLL_FREQ
50 ohm Line 0.014" Wide
1.51" Line
1.3" Length
1.33" Line
1.2" Line
SYNCHRONIZES ALL MDX's
THIS CLOCK SHOULD OCCUR AT END OF MEMORY BOUNDRY
DELAY SAME AS A742-12 TO A745-3
SM74HC394
TDLD IC
SM10EL11
SM10EL31
SM10EL01
SM10EL32
SM10EL16
SM10E016
SM10E125
SM121.0S
SM182.0S
SM274.0S
SM392.0S
SM301.0S
SM221.0S
SM51.1S
SM475.0S
SM.01uFS
BZX84-C5V1
BAV99
BF192
MDXCK
16.5 INCHES
SM.COAX.RG178B.U
FROM TRG 2
TCK
TRIG
ADCTR(1:39)
BC(1:39)
BTR(1:50)
VBBCK
ROUTING ORDER
LENGTH
LINE LENGTH
LINES LENGTH
TERM

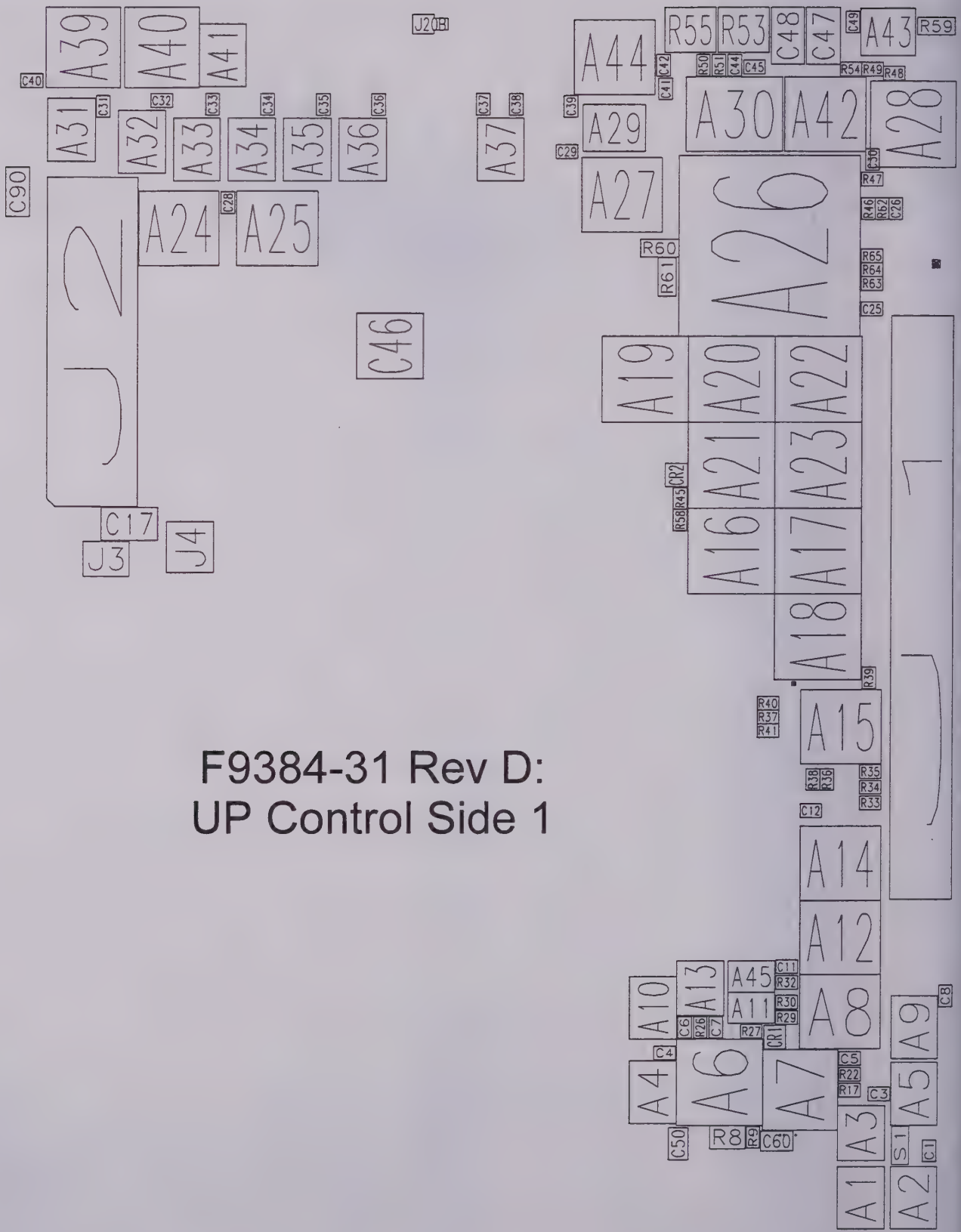

LeCroy CORPORATION
MODEL 900022
TIMEBASE (4/8)
DWG NO. 900022-S1
SH 52 of 56
NOTE: ALL LINES WITH SPECIFIED LENGTH MUST BE 75 OHM
LINE LENGTH 3.37"
LINE LENGTH 0.42"
LINE LENGTH 1.54"
LINE LENGTH 7.2" A770 to A772
LINE LENGTH 12.1" A770 to A771
LINE LENGTH 1" > than A712-3 to A721-2
50 ohm line 0.014" Wide
0.24" line
A711 SM10E131.ALT
A727 SM10E016
A726 SM10125
A734 SM10125
A756 SM10H124
A728 SM74HCT02
A772 SM10EL31
A771 SM10EL31
A770 SM10EL31
A718 SM10EL31
A717 SM10EL01
RAMPSP
ICK
SCXTCK
RAMPST
CKM
TRIG
BTB(1:50)
BRT(0:3)
READRT
VBBTRG
TRIGD


LeCroy CORPORATION
MODEL 900022
TIMEBASE (S/B)
DWG NO 900022 S1
SH 53 OF 56
RESOLUTION :
500 Ms/s 10 ps/c
400 Ms/s 12.5 ps/c
200 Ms/s 12.5 ps/c
3.2 us variation
200 bins
16 ns ICK clock
10.5 us
16.2 ns
9.33 ns
1.55 v
9.8 v
-8.2 v
-1.34 v
BTB(1:50)
_RAMPST
RAMPST
RAMPSP
+12V_TB
-12V_TB
+15V
-15V
VCC
VEE

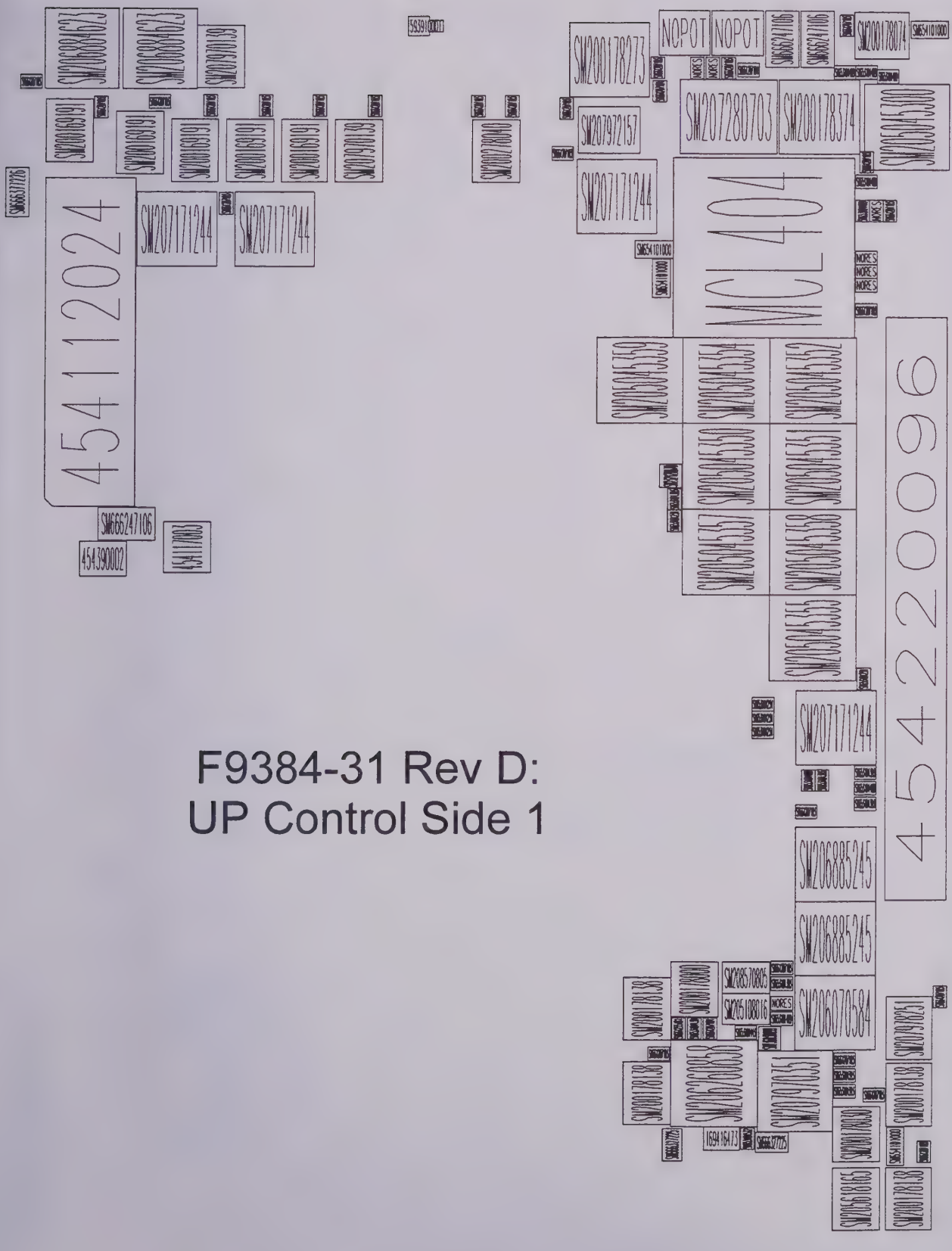

LeCroy CORPORATION
MODEL 900022
TIMEBASE (6/8)
DWG NO 900022-S1
SH 54 OF 56
ECO 1000
OC_TRCKL IS THE FAST BYPASS AROUND THE SMART TRIGGER CHIP
THE SELECT LINES ARE INVERTED WITH RESPECT TO THE 9374


LeCroy CORPORATION
MODEL 900022
TIMEBASE (7/8)
DWG NO 900022-S1
SH 55 OF 56
Delay lines to compensate ECL step logic
A724 MST412
A709 SM10H102
A763 SM10EL31
A759 SM74HC367
A702 SM74HC253
A708 SM74HC273
A710 SM10EL11
A701 SM74HC02
A726 SM10125.ALT
DL700 DL-1L6-15
DL701 DL-1L6-15
BUZZER R2709 TMB-05
C-PAD-010
_RESET
_SYNC
_SYSCLK
_VALCKL
_SM_TRCKL
_SM_TRIG
_VALOUT
_READOUT
EXTCTH1
EXTCTH2
VBBTRG
TRIG
DVCKO
CKPCAL
TO FE
SM1_EN

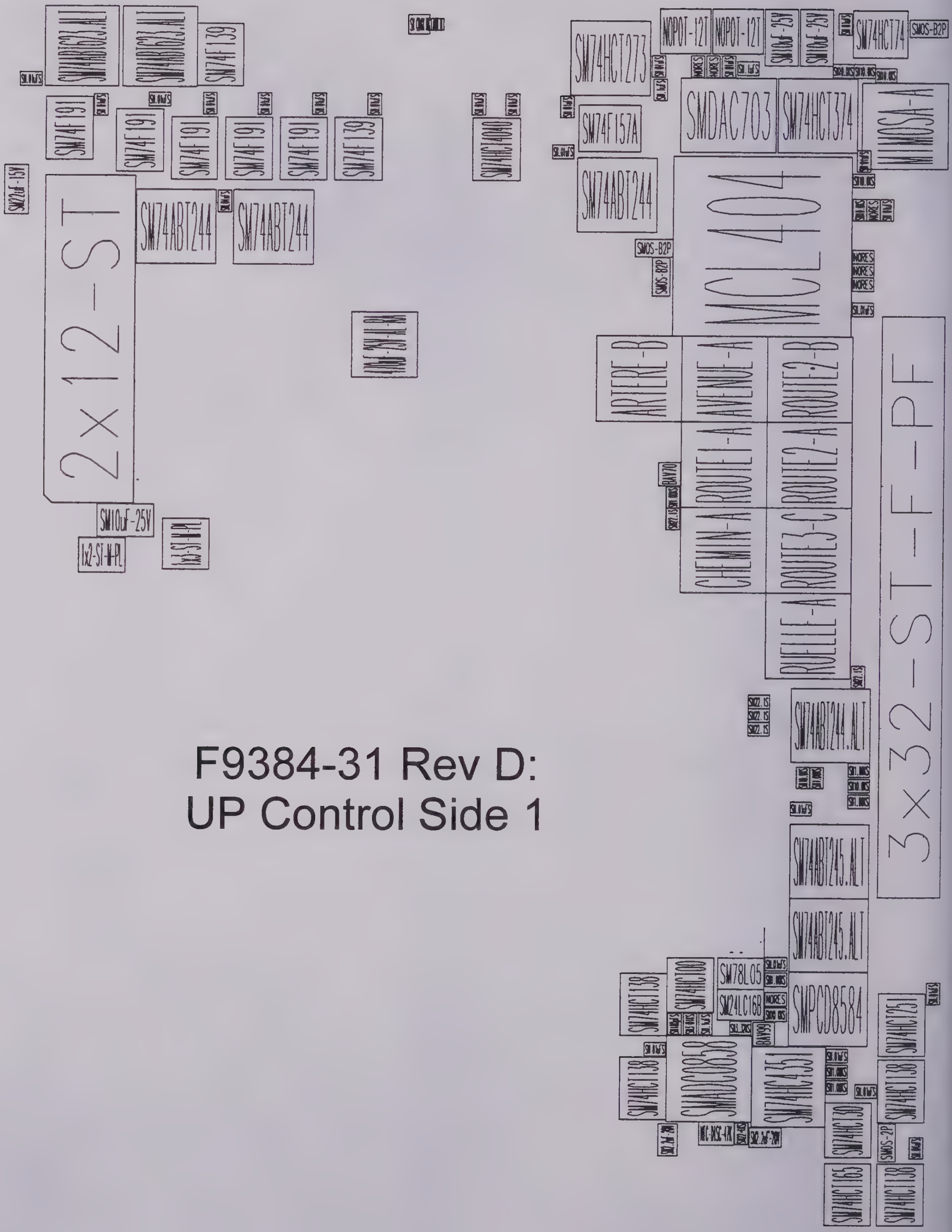

TRIGEN FROM MTB411
ENABLE THIS TRIGGER LATCH FIRST THEN THE SMT412
THE CONNECTIONS BETWEEN THE FLIP FLOPS MUST BE SHORT
50 ohm line 0.014" Wide
1ns 6.5" length
TRIG
FAST_DC_TRIG
0.006" wide line
TEST LINE 8 INCHES SM_COAX_RG178B_U
LeCroy CORPORATION
MODEL 900022
TIMEBASE (8/8)
DWG NO 900022 S1
SH 56 OF 56
ECO. 1000



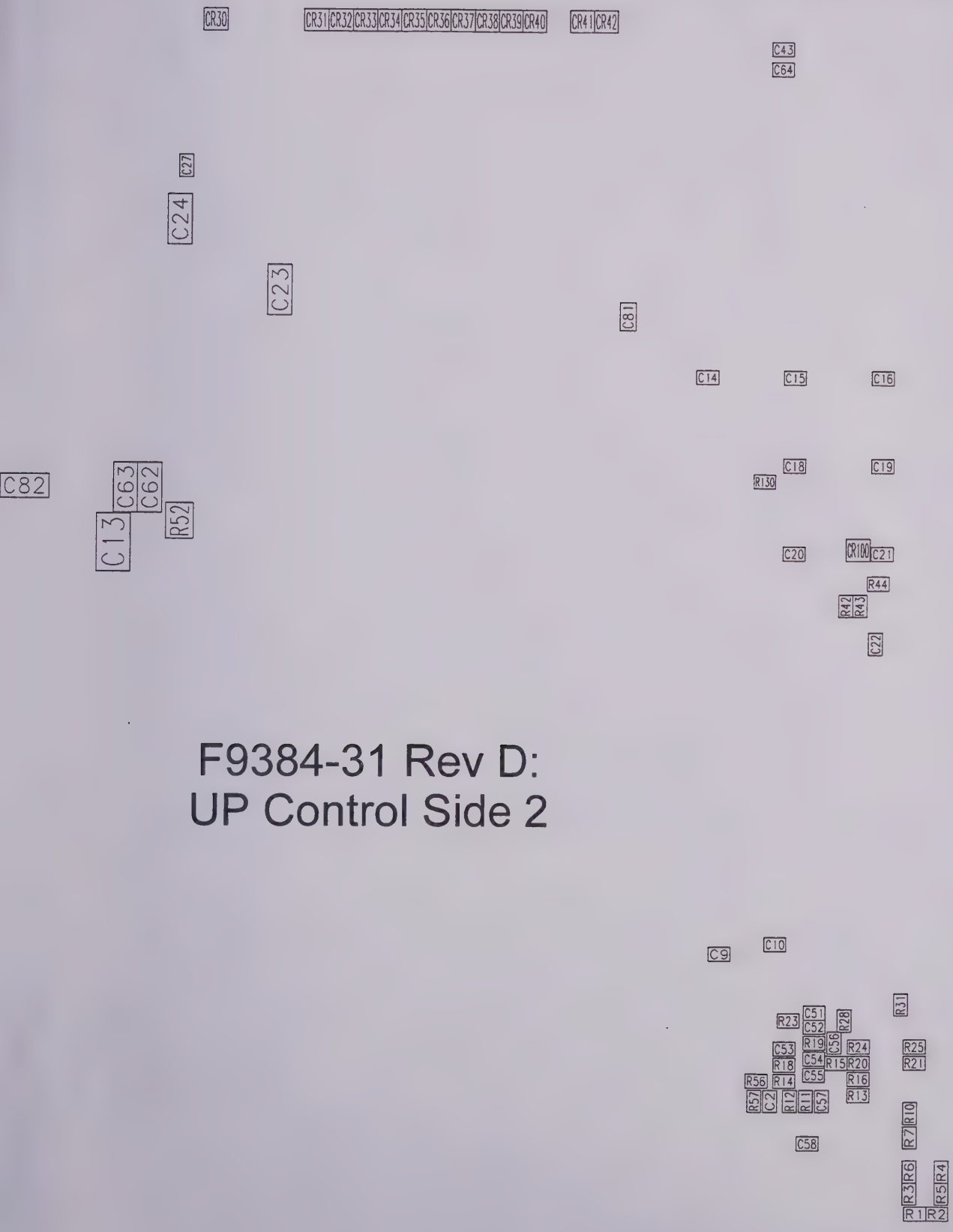
F9384-31 Rev D:
UP Control Side 1



F9384-31 Rev D:
UP Control Side 1

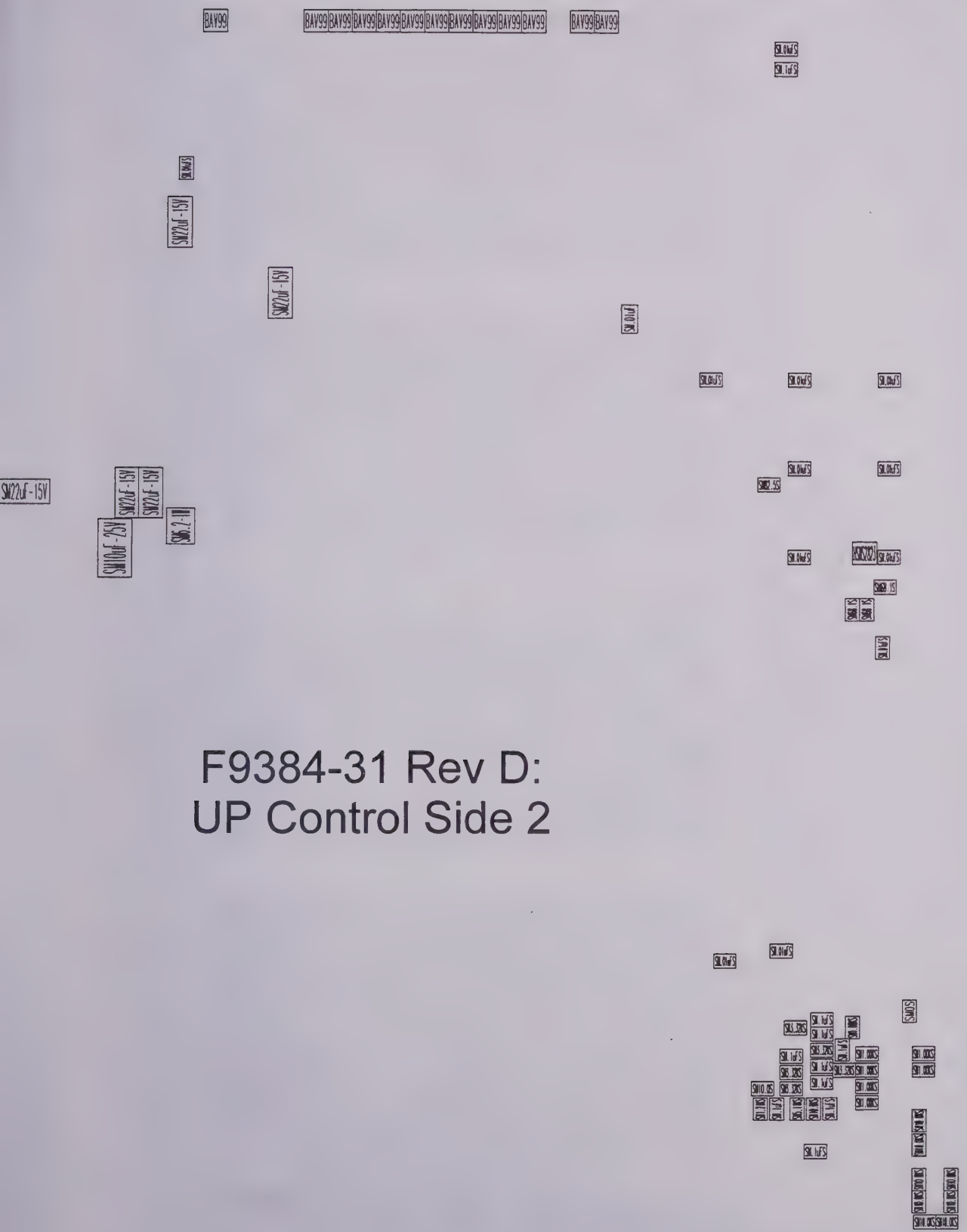


F9384-31 Rev D:
UP Control Side 1



F9384-31 Rev D: UP Control Side 2

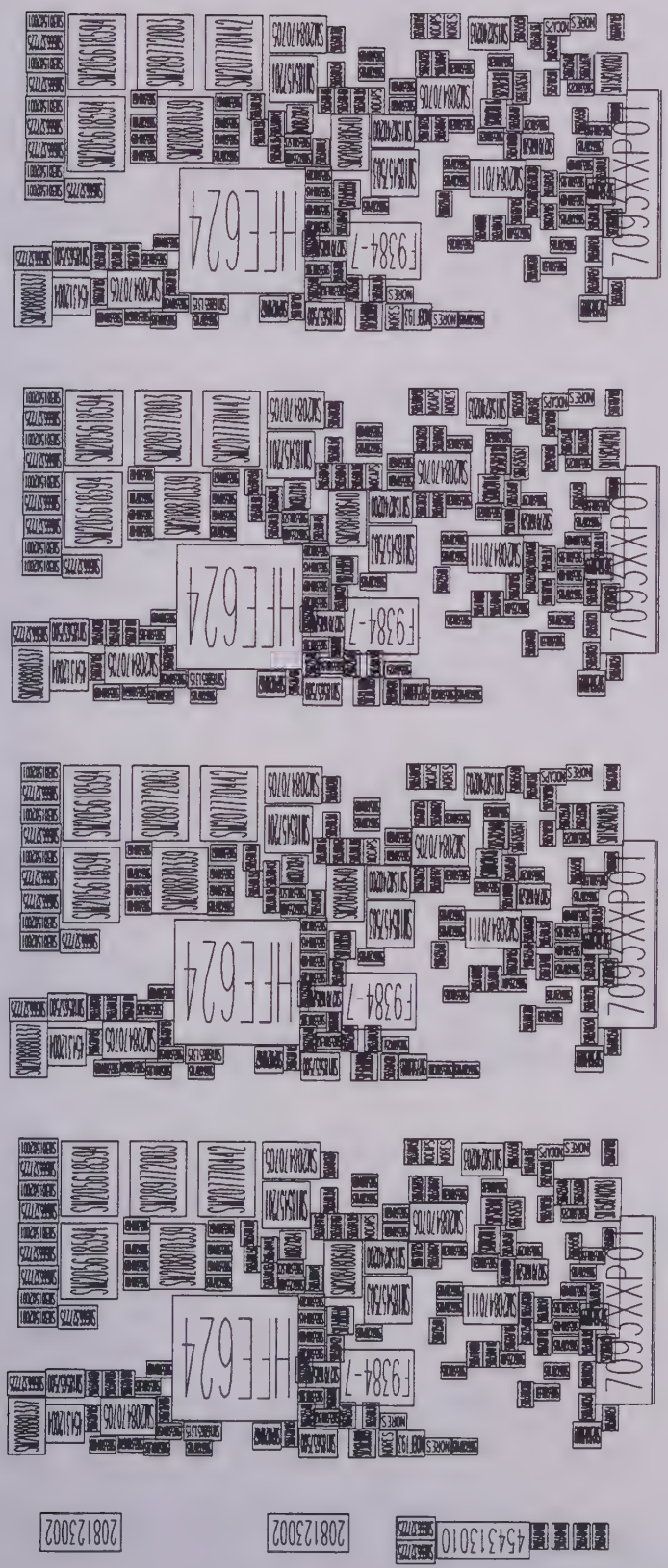
F9384-31 Rev D:
UP Control Side 2



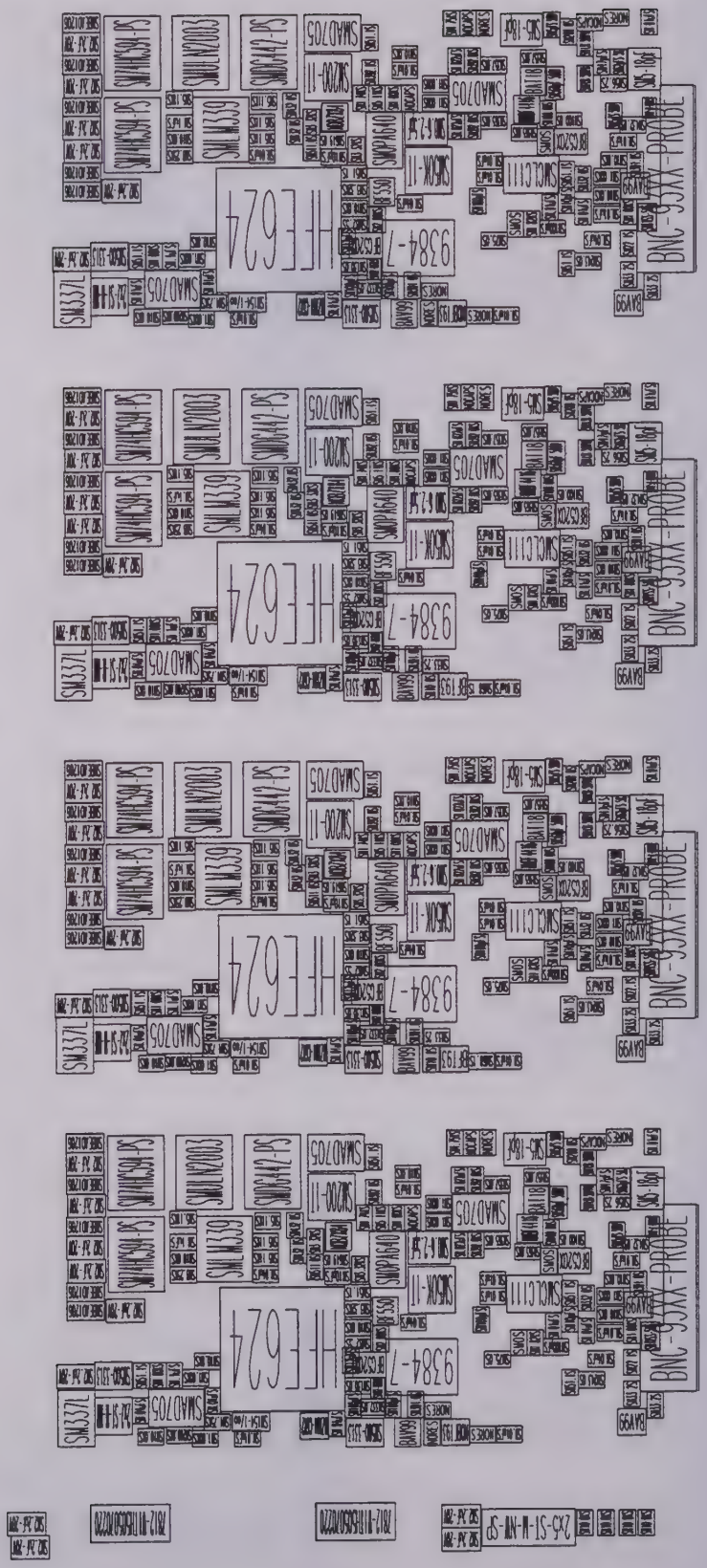
F9384-31 Rev D: UP Control Side 2

F9384-31 Rev D:
Front End Channels Side 1

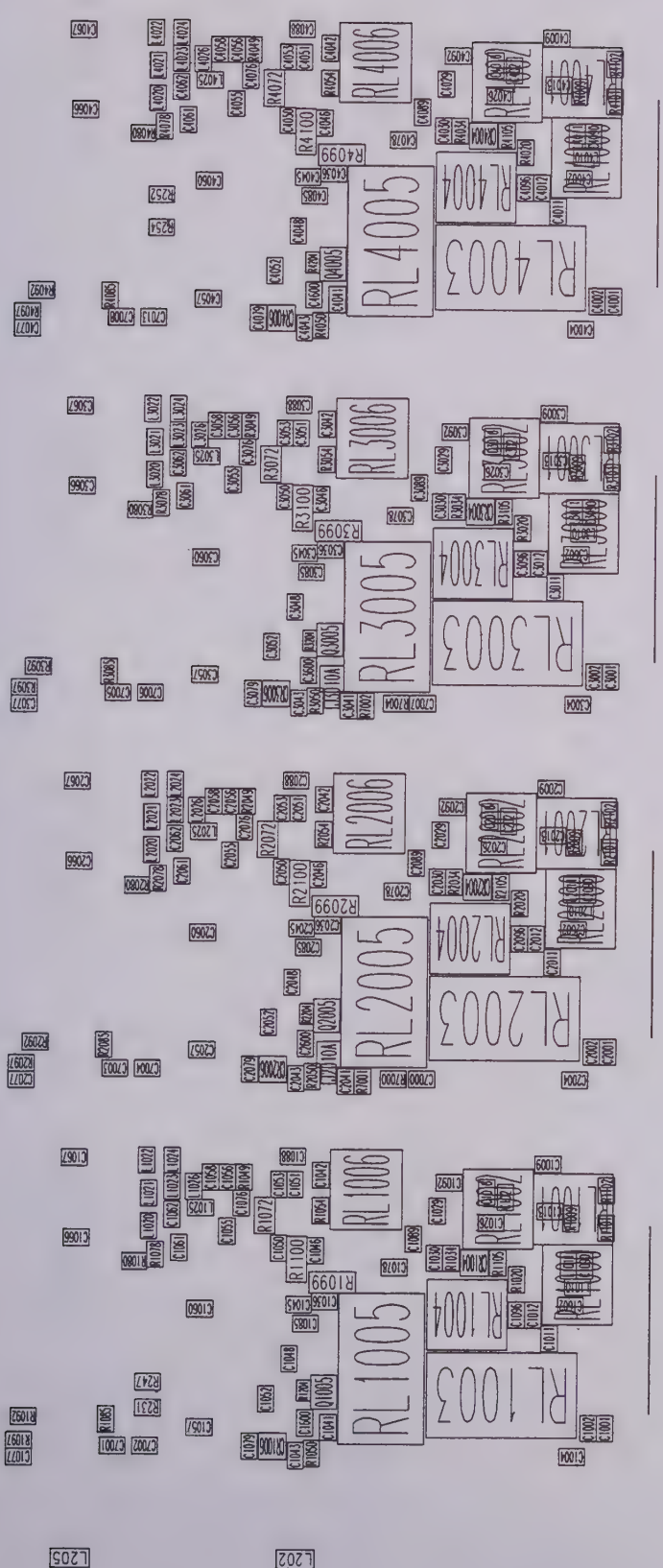
F9384-31 Rev D:
Front End Channels Side 1



F9384-31 Rev D:
Front End Channels Side 1

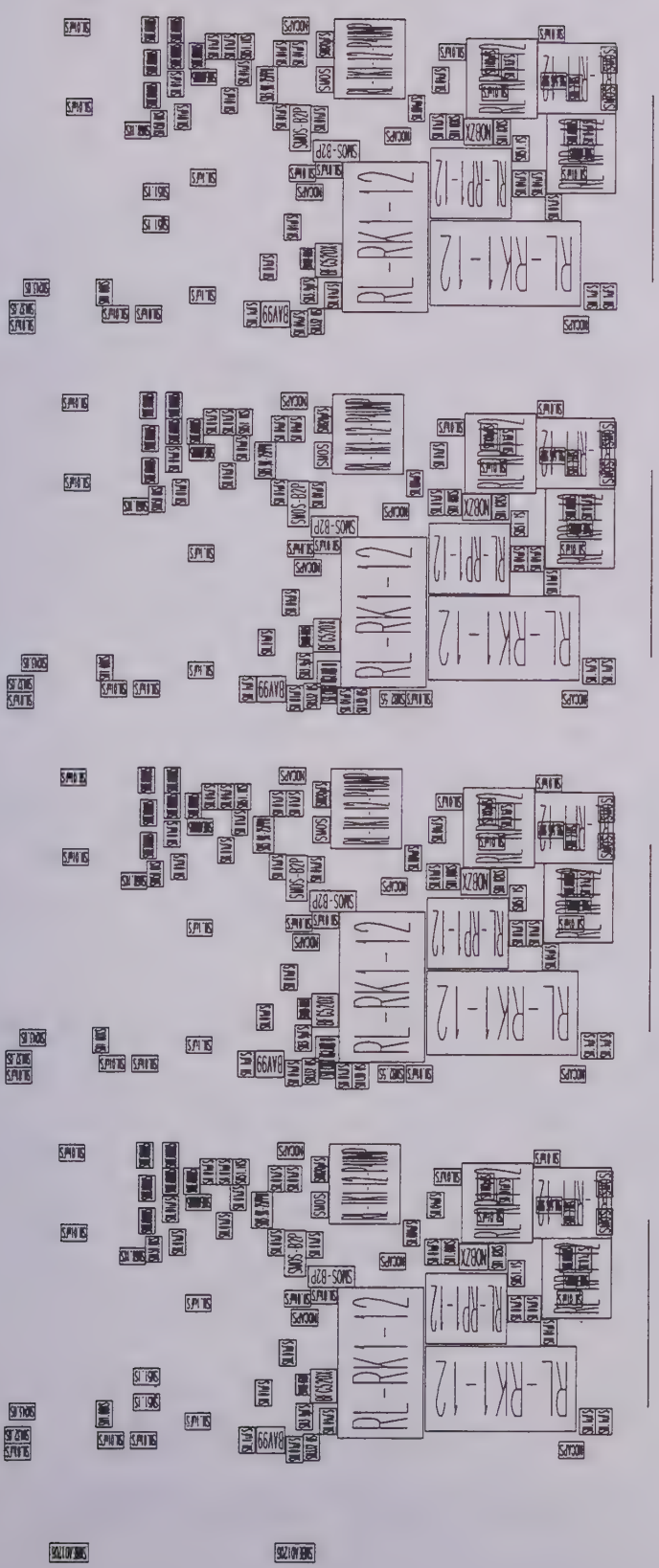


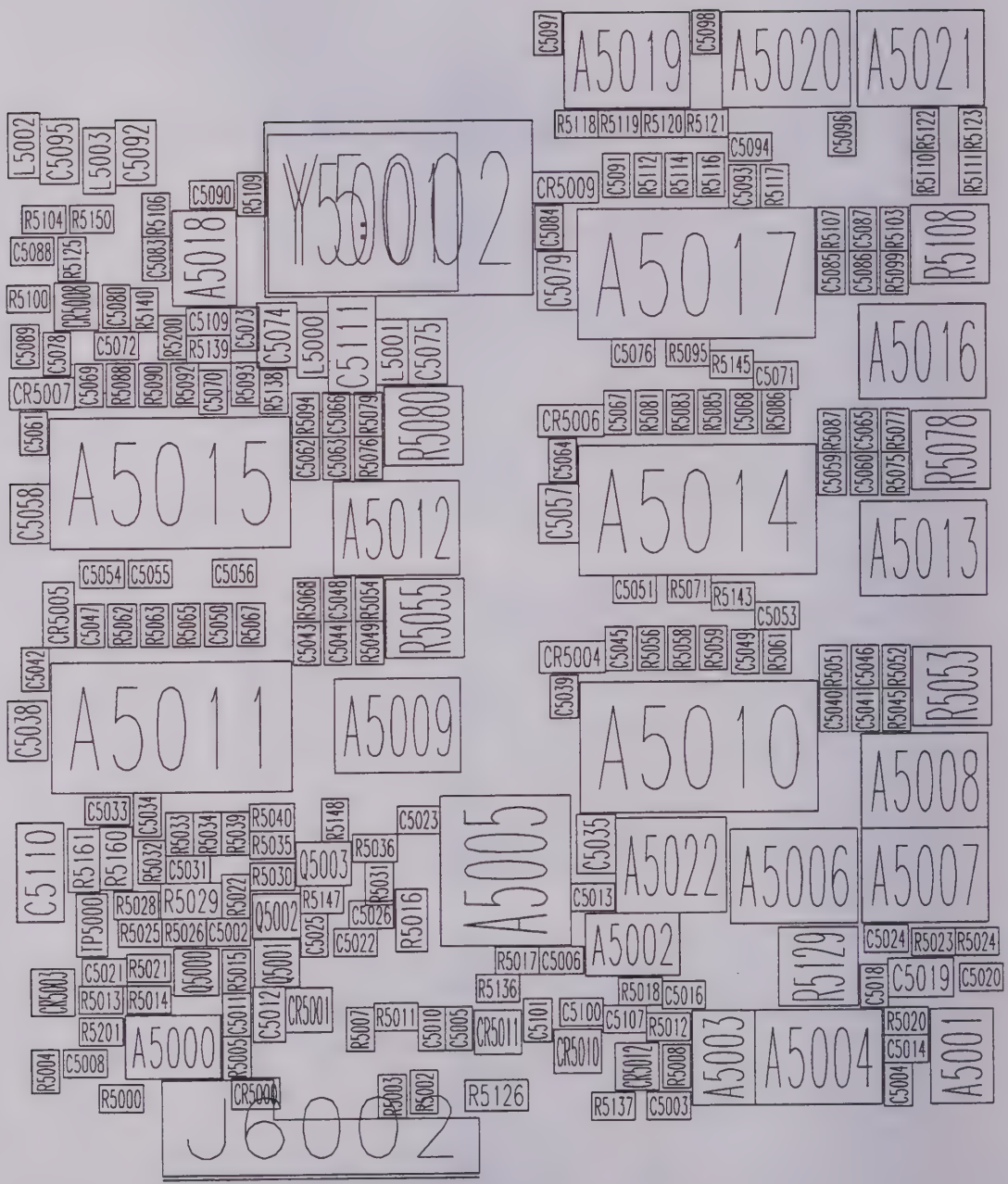
F9384-31 Rev D:
Front End Channels Side 2



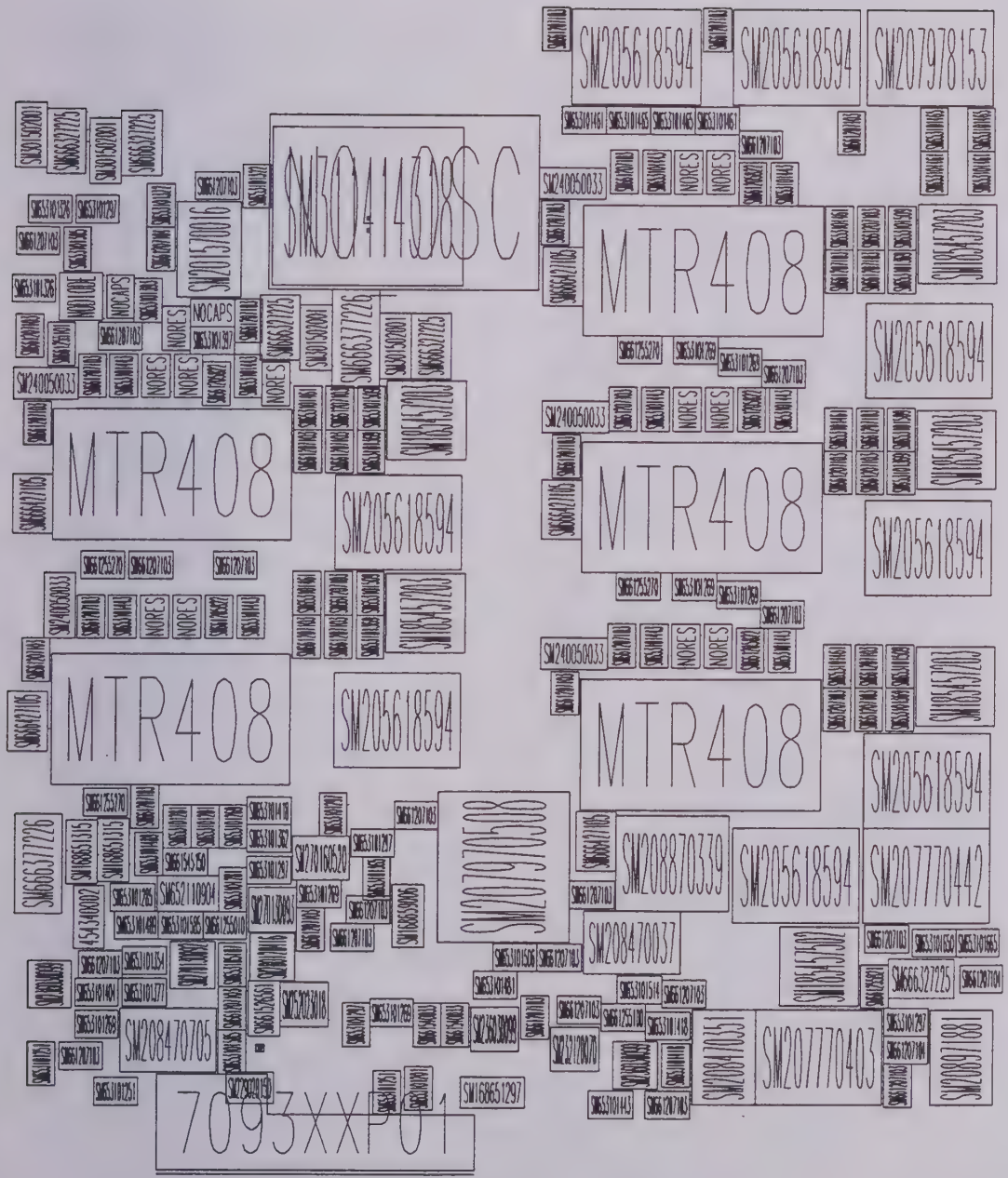
F9384-31 Rev D:
Front End Channels Side 2

F9384-31 Rev D:
Front End Channels Side 2

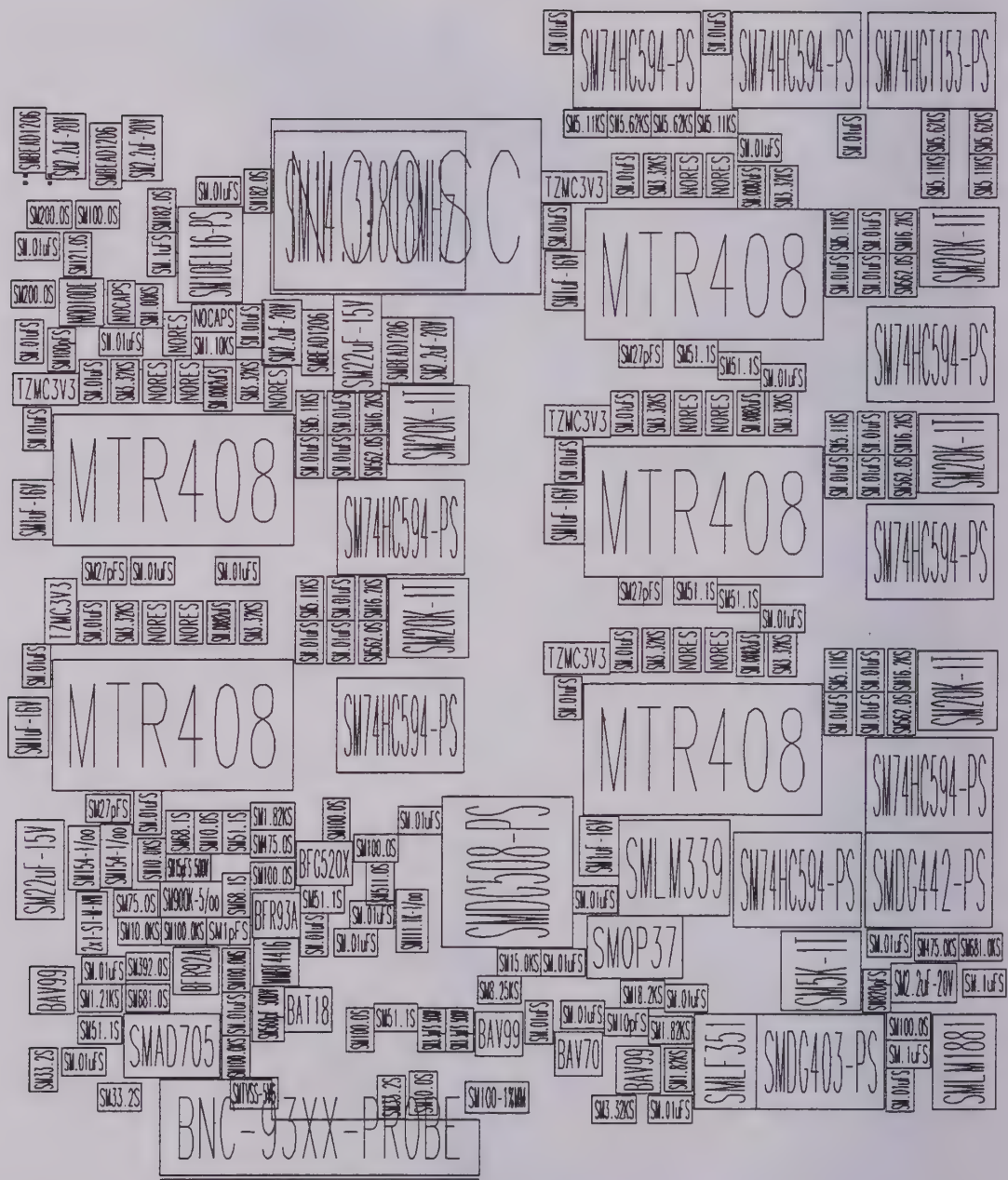




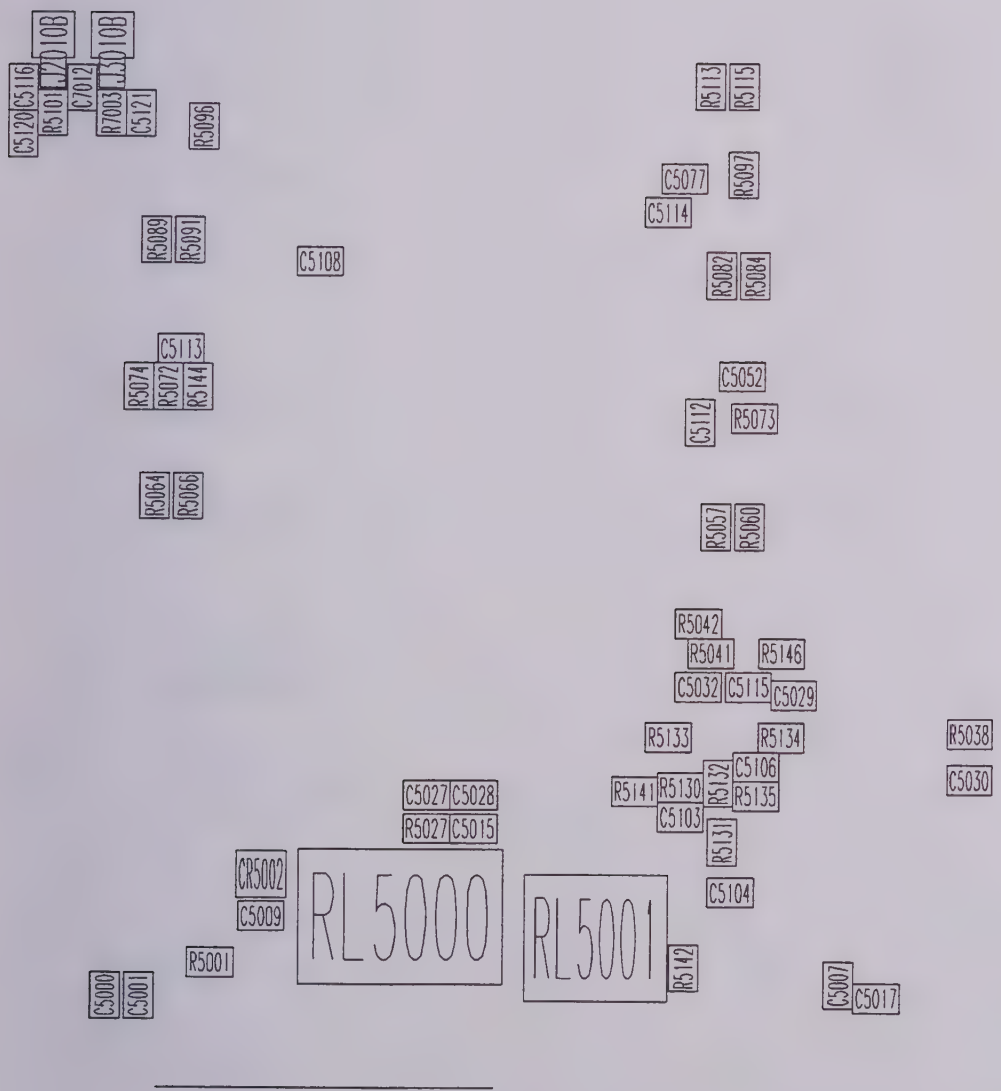
F9384-31 Rev D:
Front End Trigger Side 1



F9384-31 Rev D:
Front End Trigger Side 1



F9384-31 Rev D:
Front End Trigger Side 1



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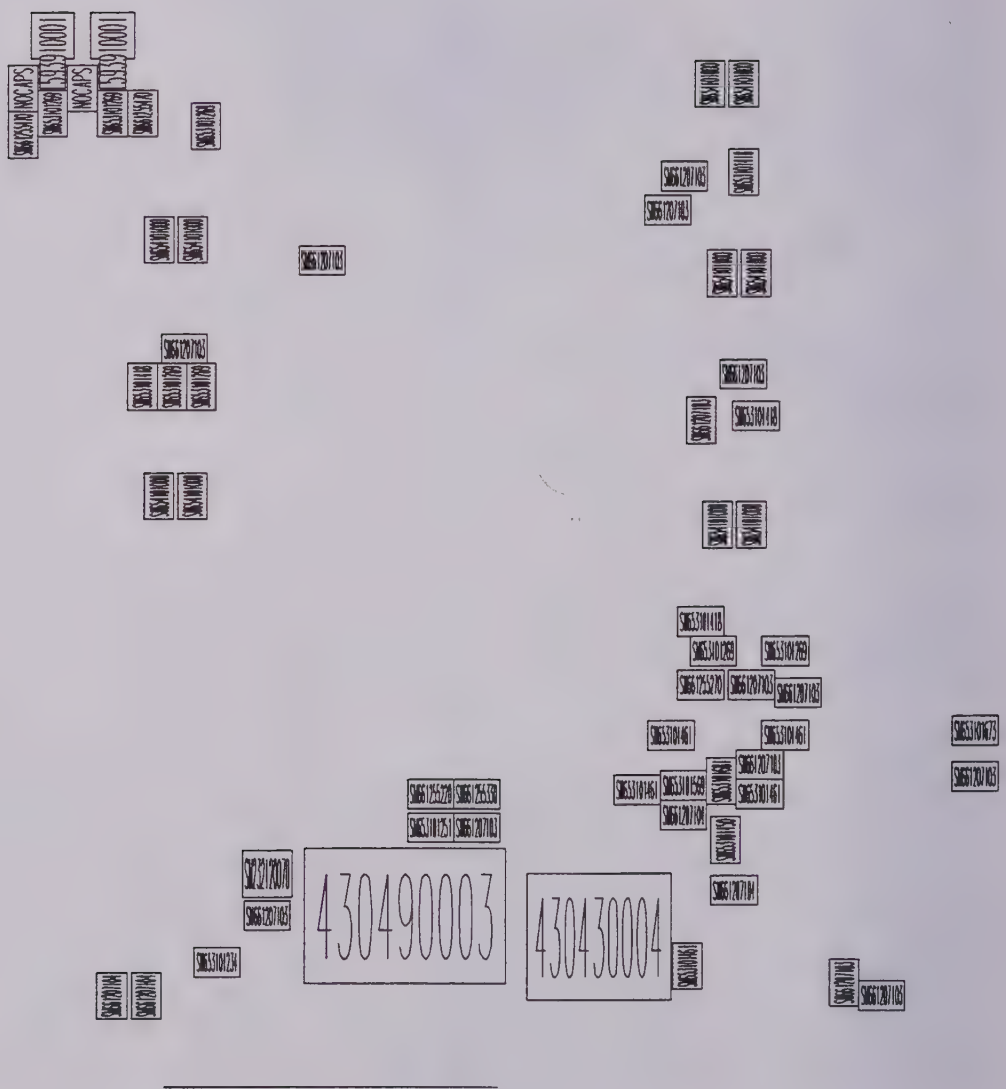
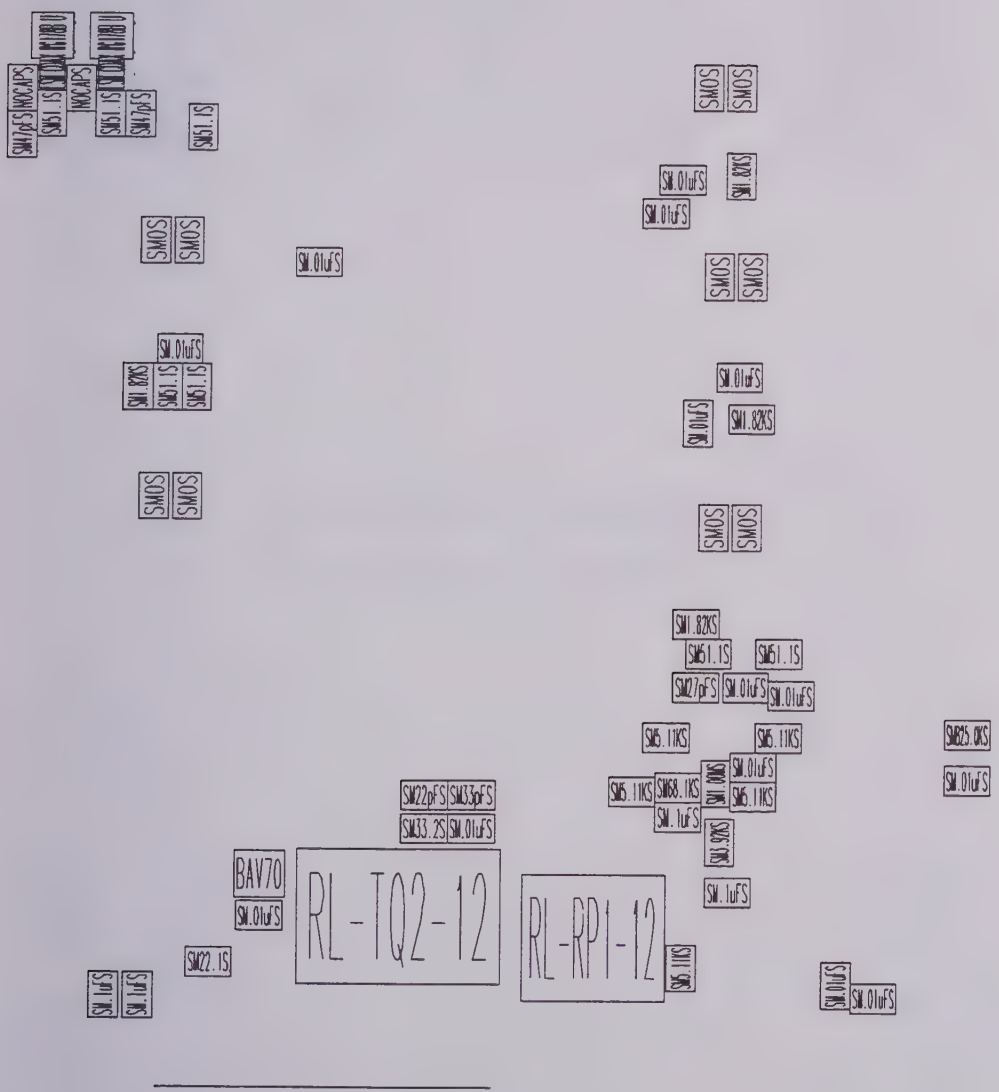
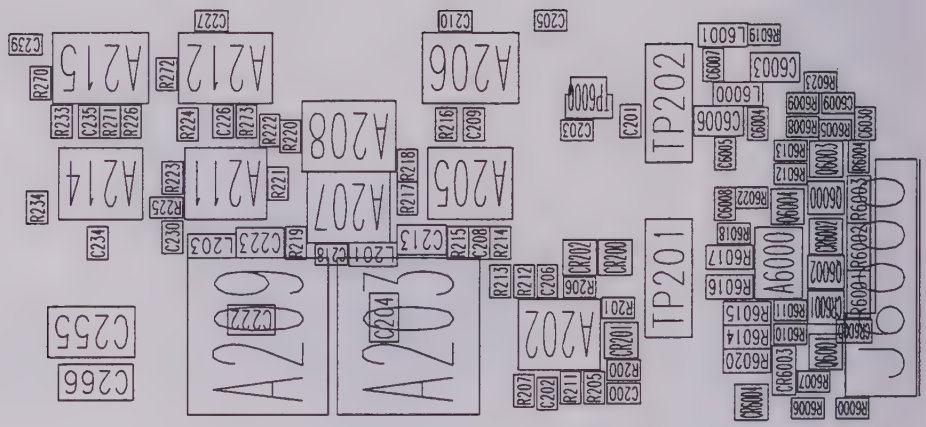
Front End Trigger Side 2



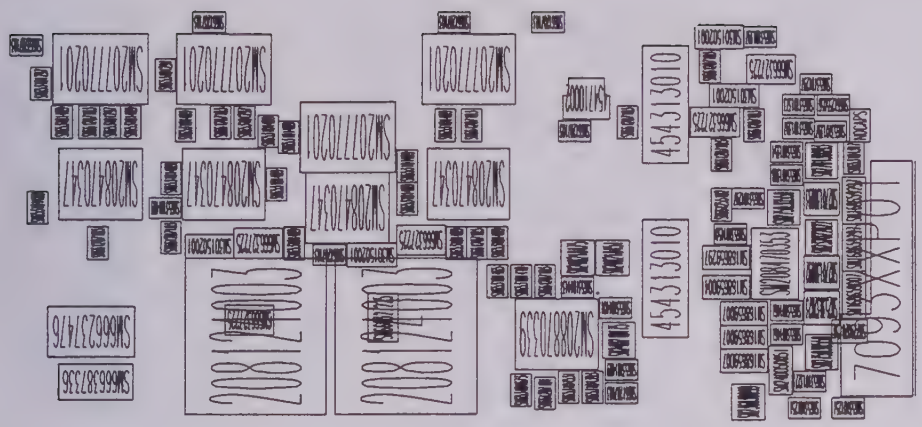
F9384-31 Rev D:
Front End Trigger Side 2



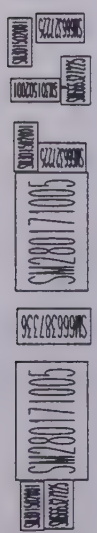
F9384-31 Rev D:
Front End Trigger Side 2

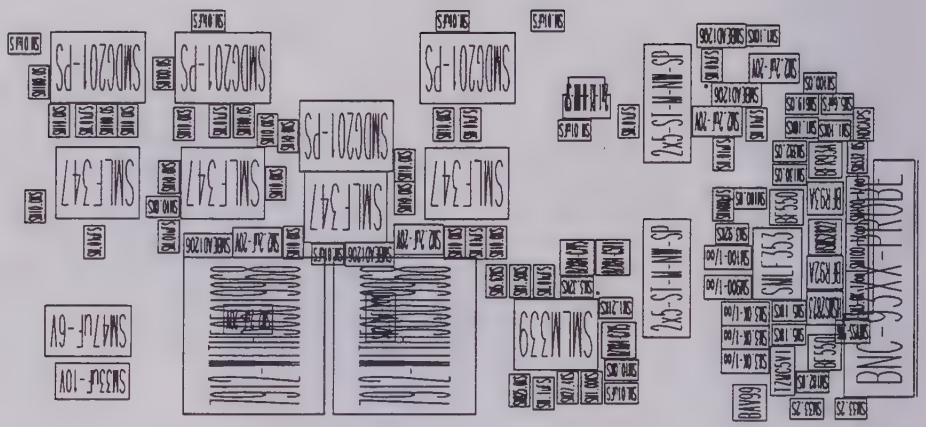


F9384-31 Rev D:
Front End Side 1



F9384-31 Rev D:
Front End Side 1





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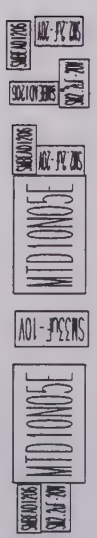
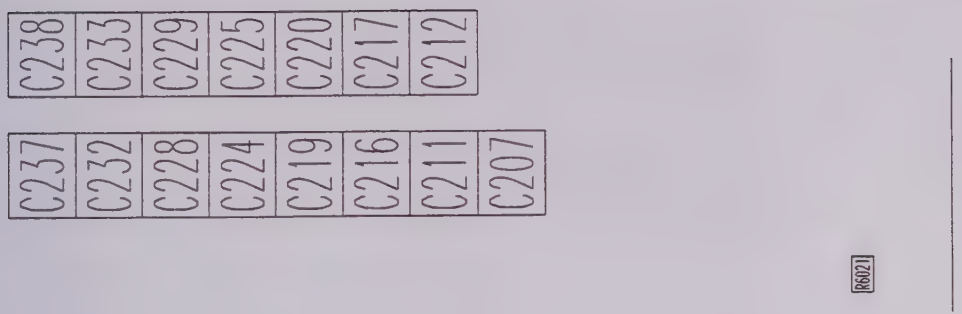
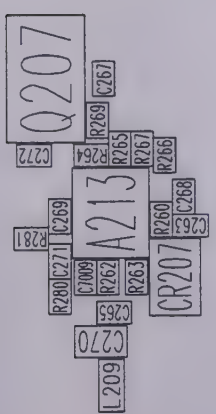
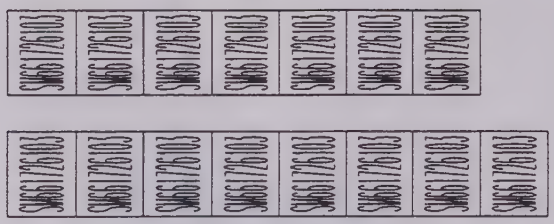
Front End Side 1



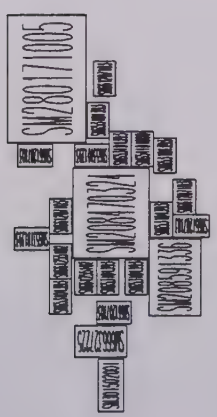


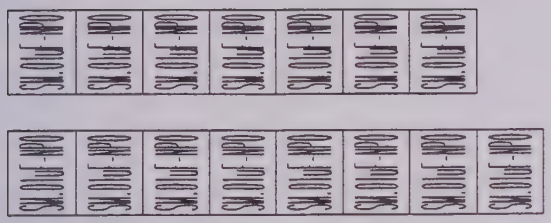
F9384-31 Rev D: Front End Side 2



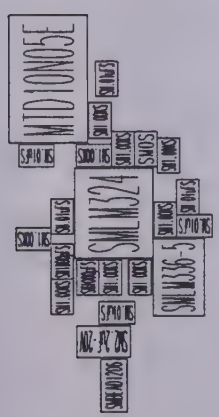


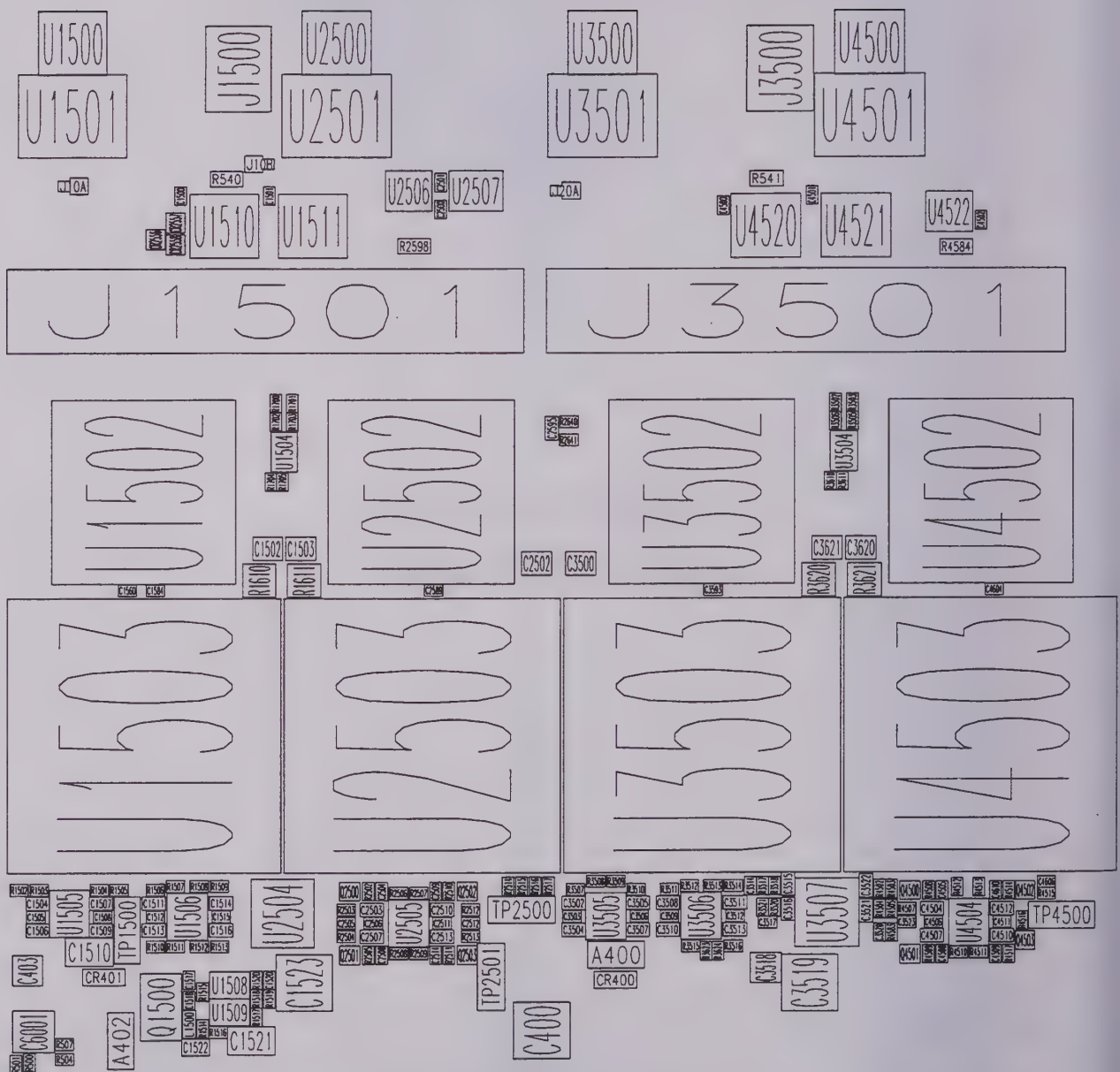
F9384-31 Rev D:
Front End Side 2



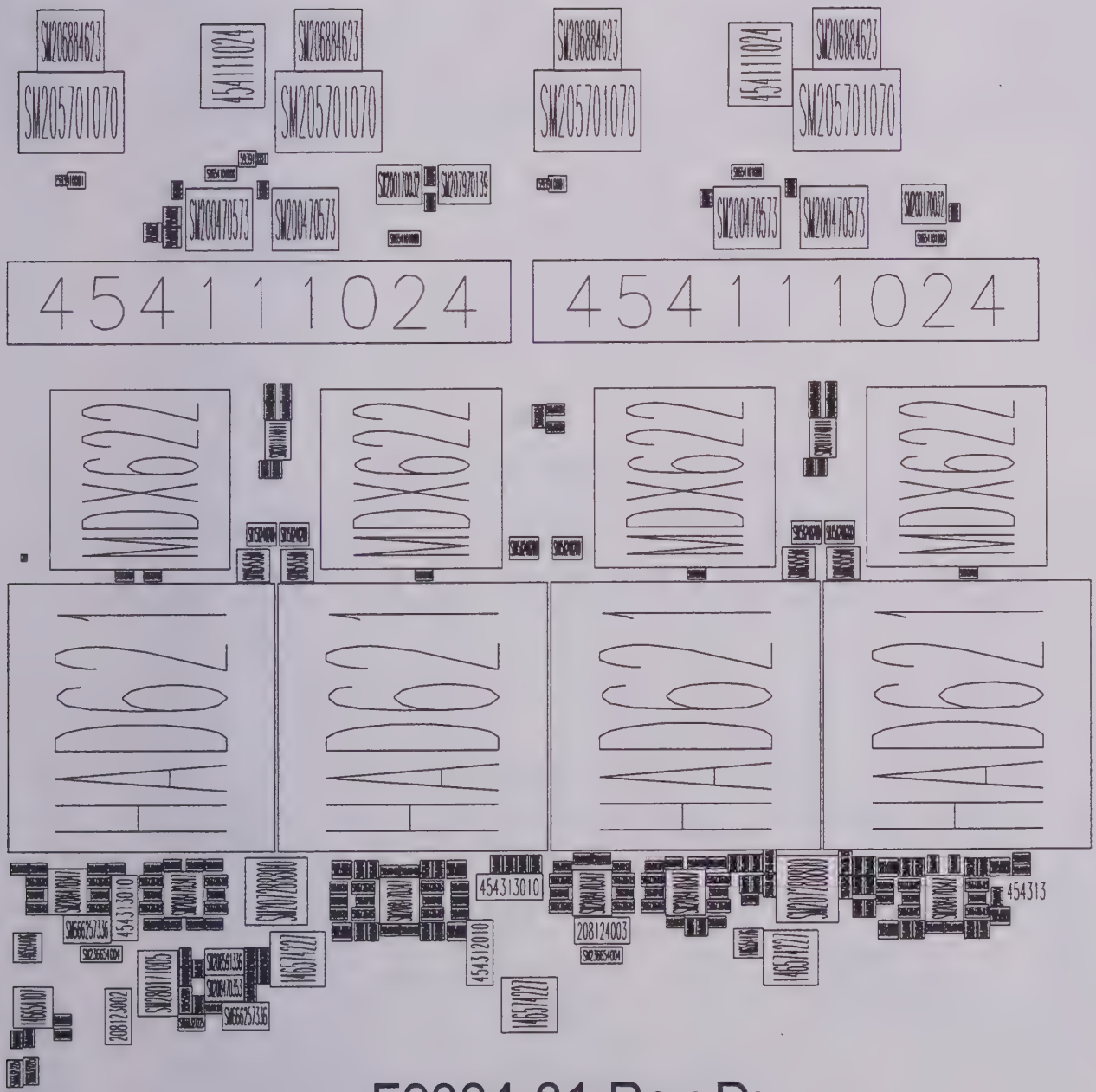


F9384-31 Rev D:
Front End Side 2

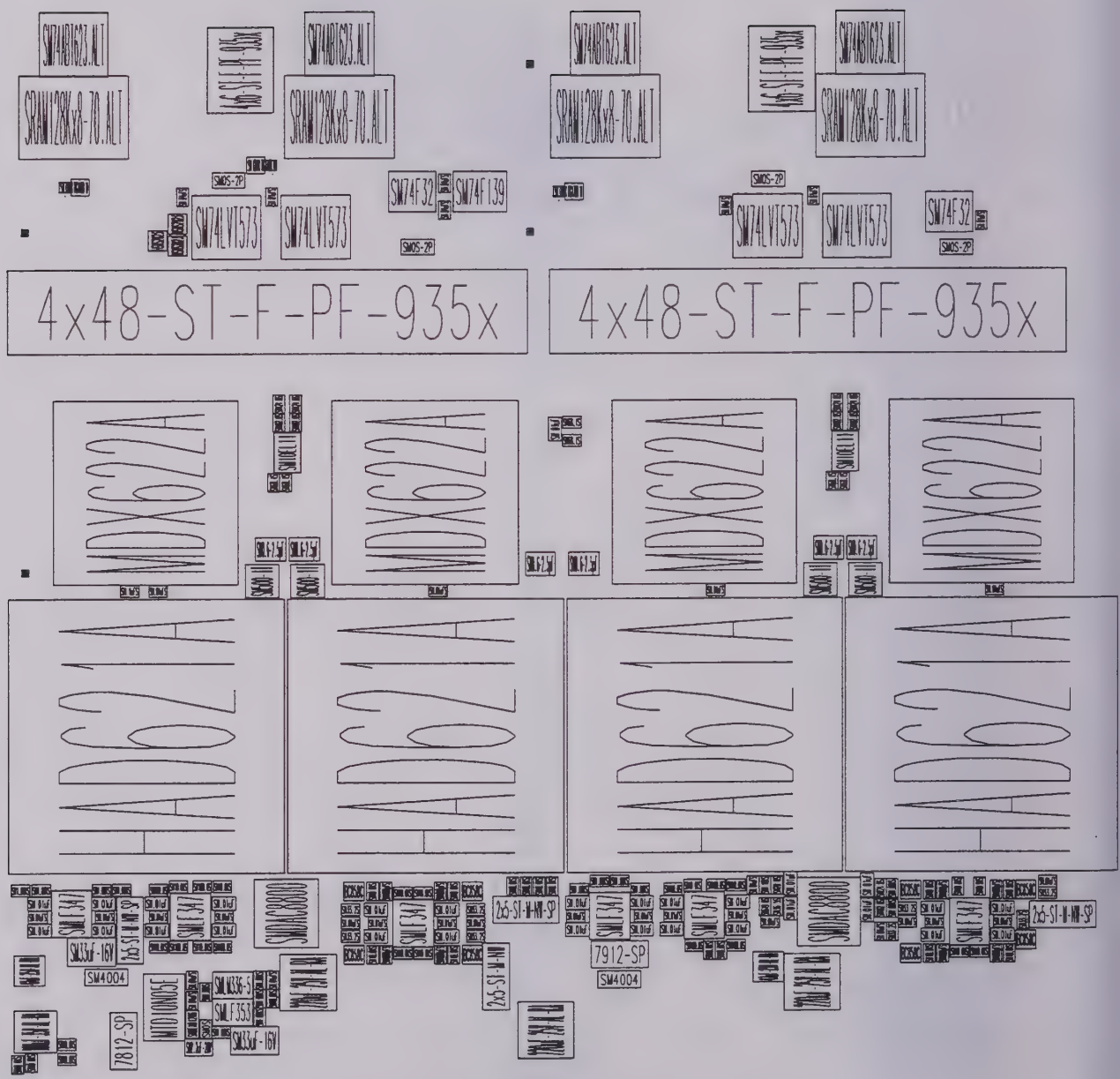




F9384-31 Rev D:
ADC Side 1



F9384-31 Rev D:
ADC Side 1



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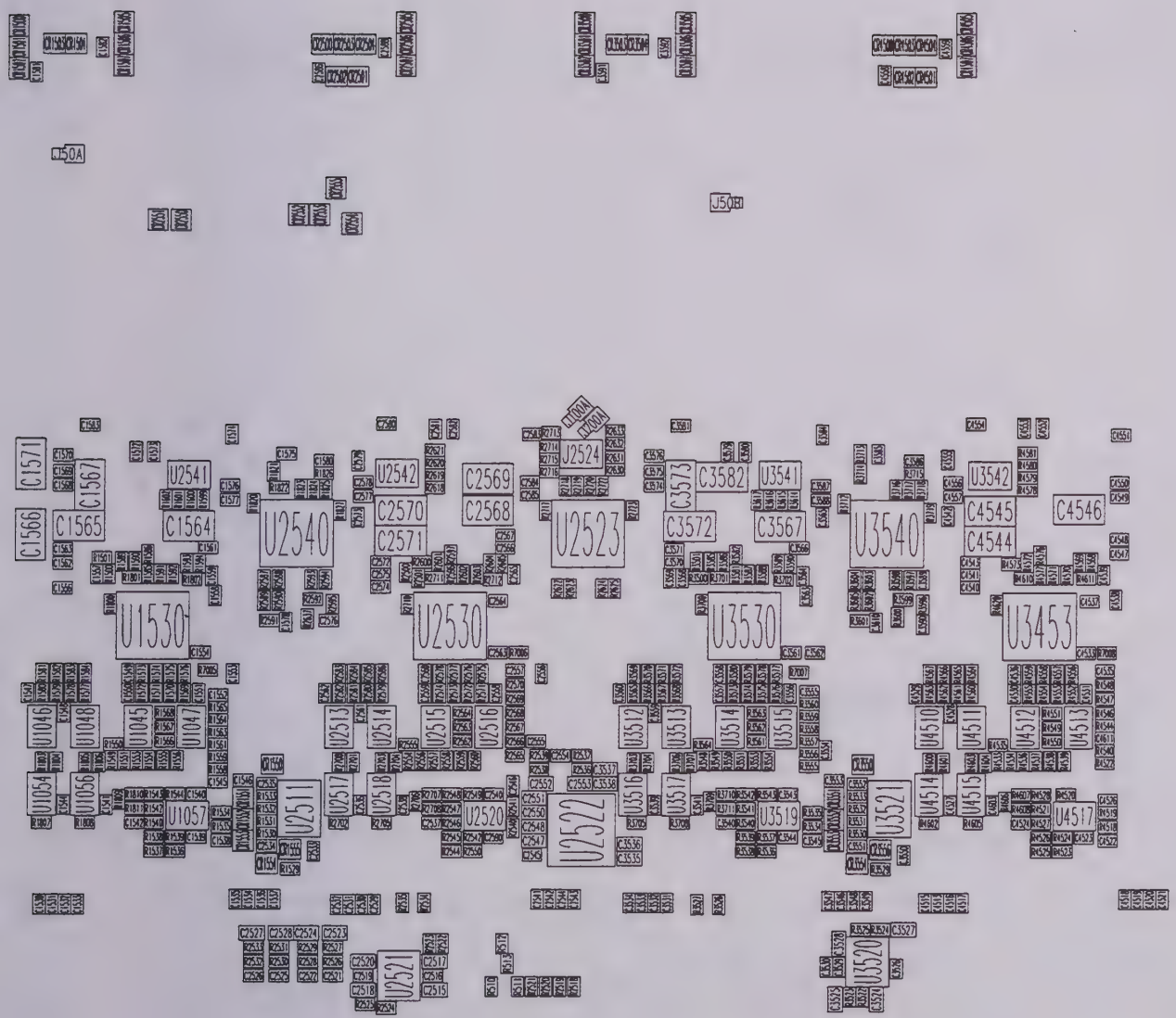
ADC Side 1



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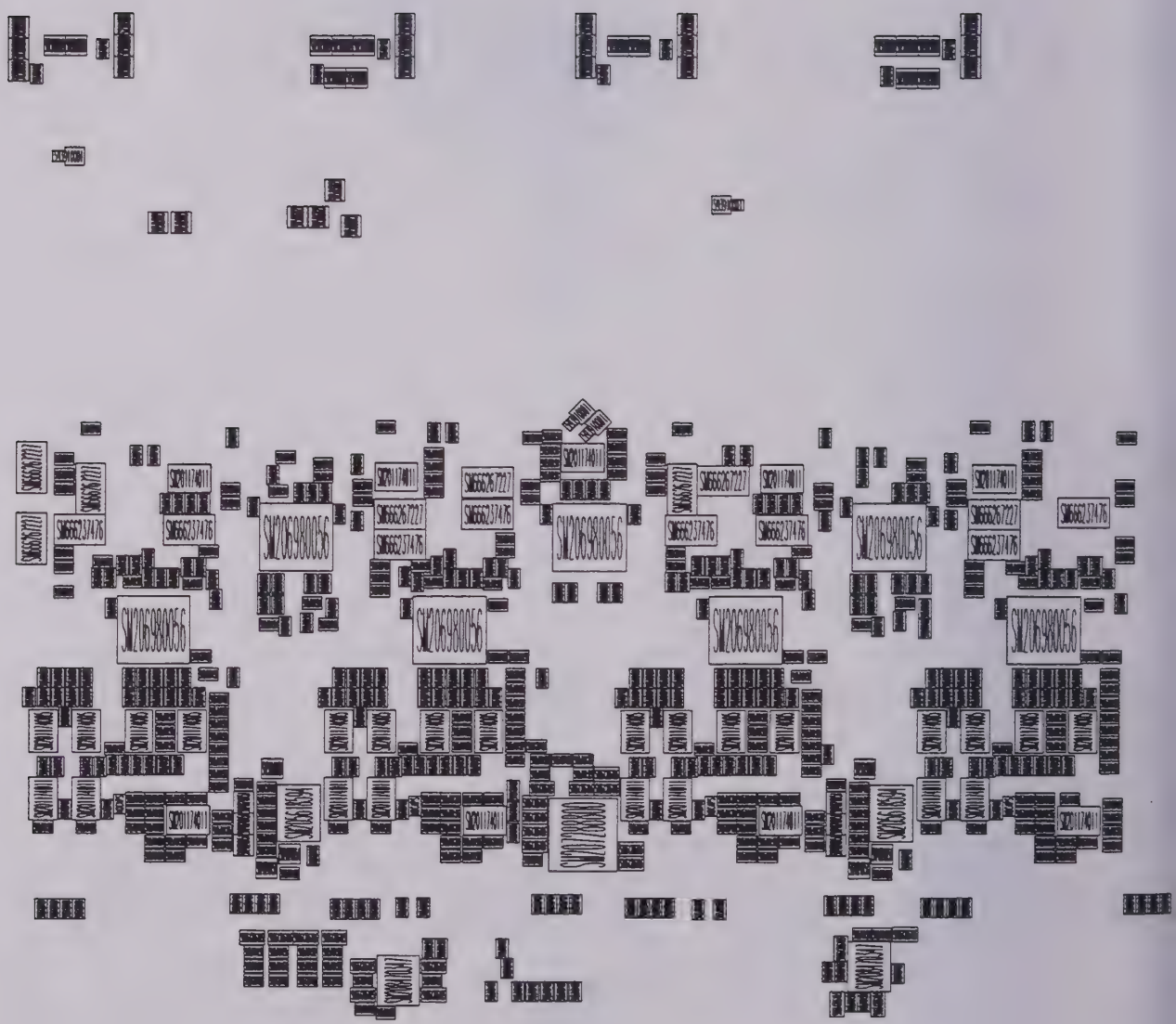

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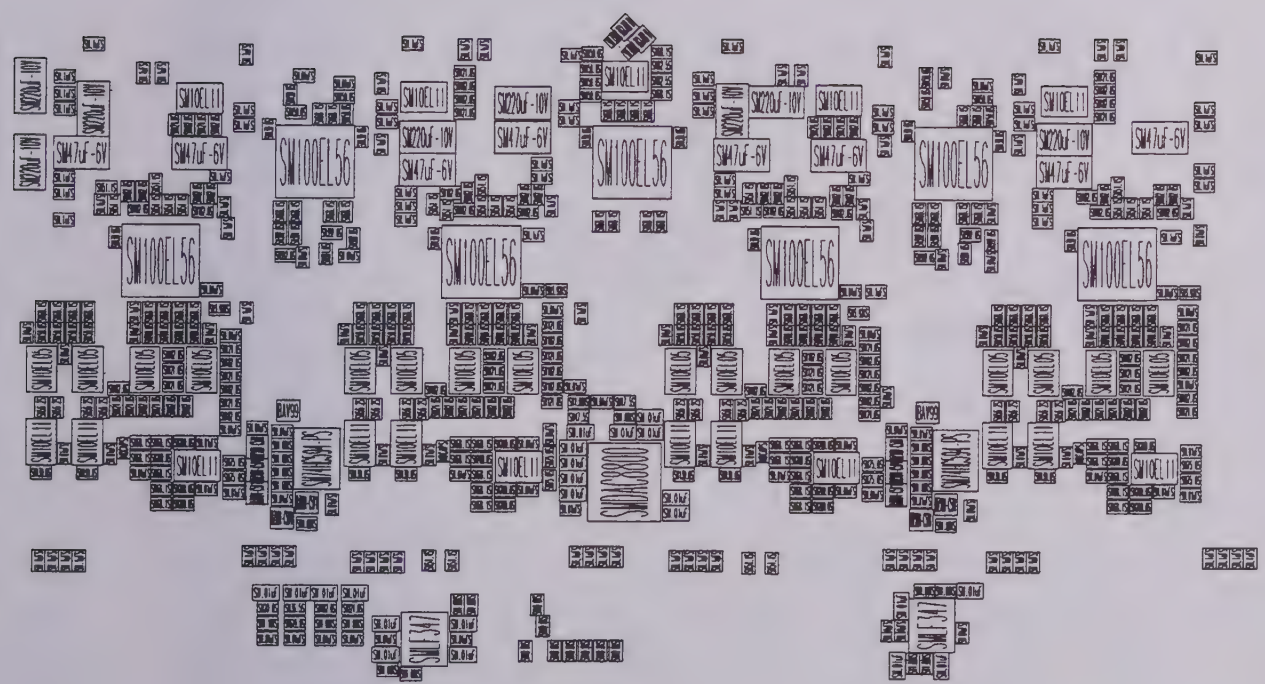

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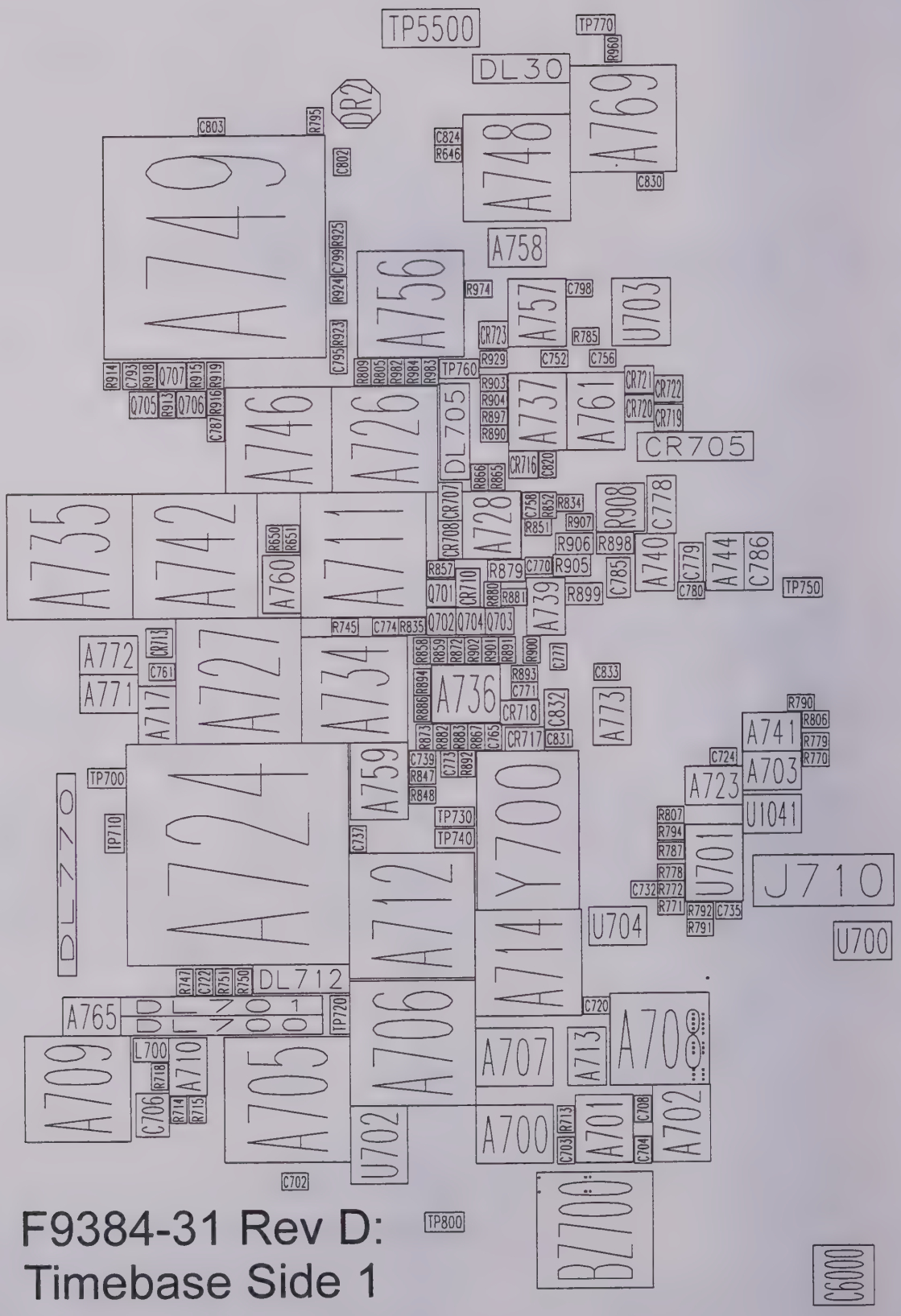

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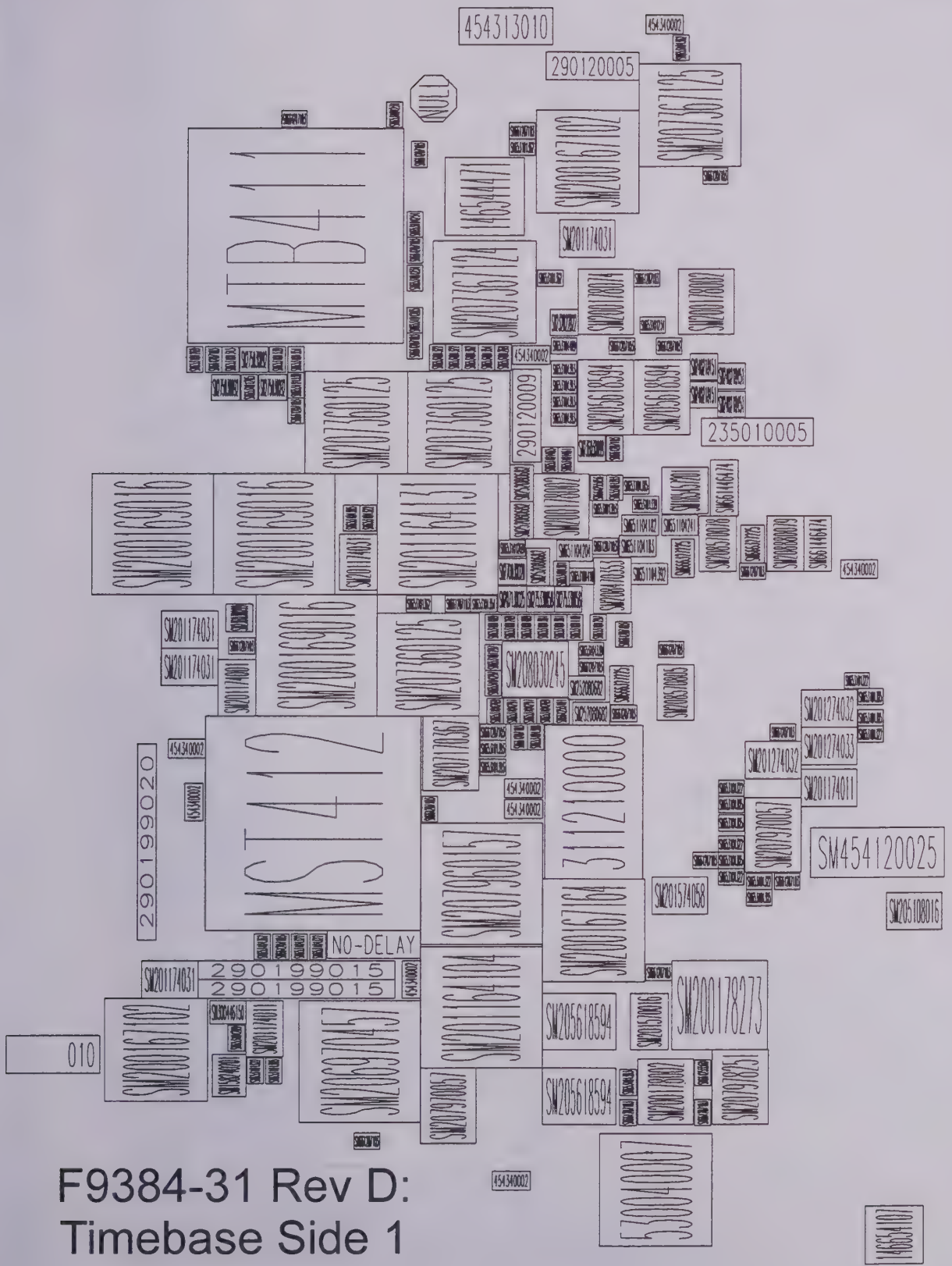

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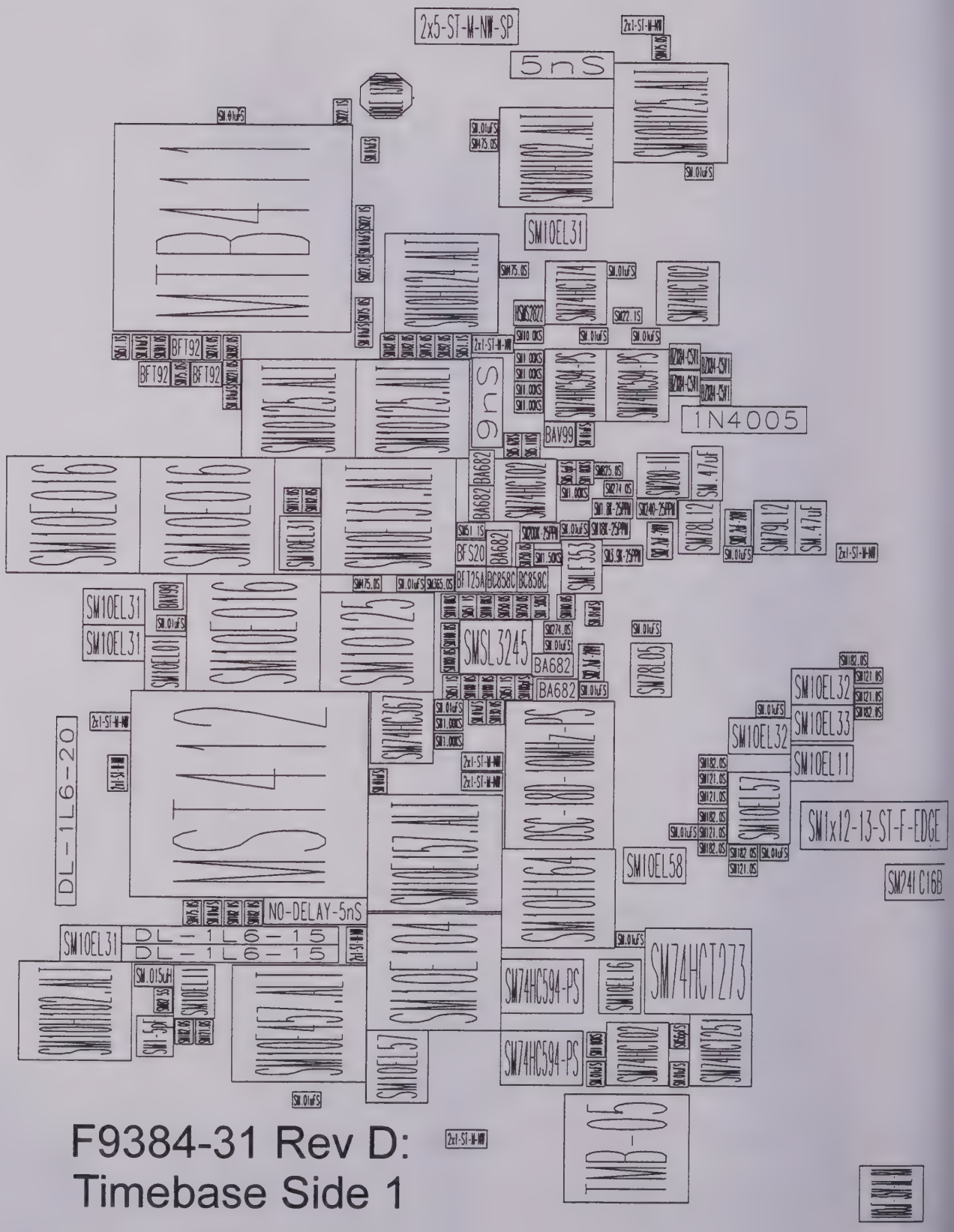
Timebase Side 1


2x5-ST-M-NW-SP
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9nS
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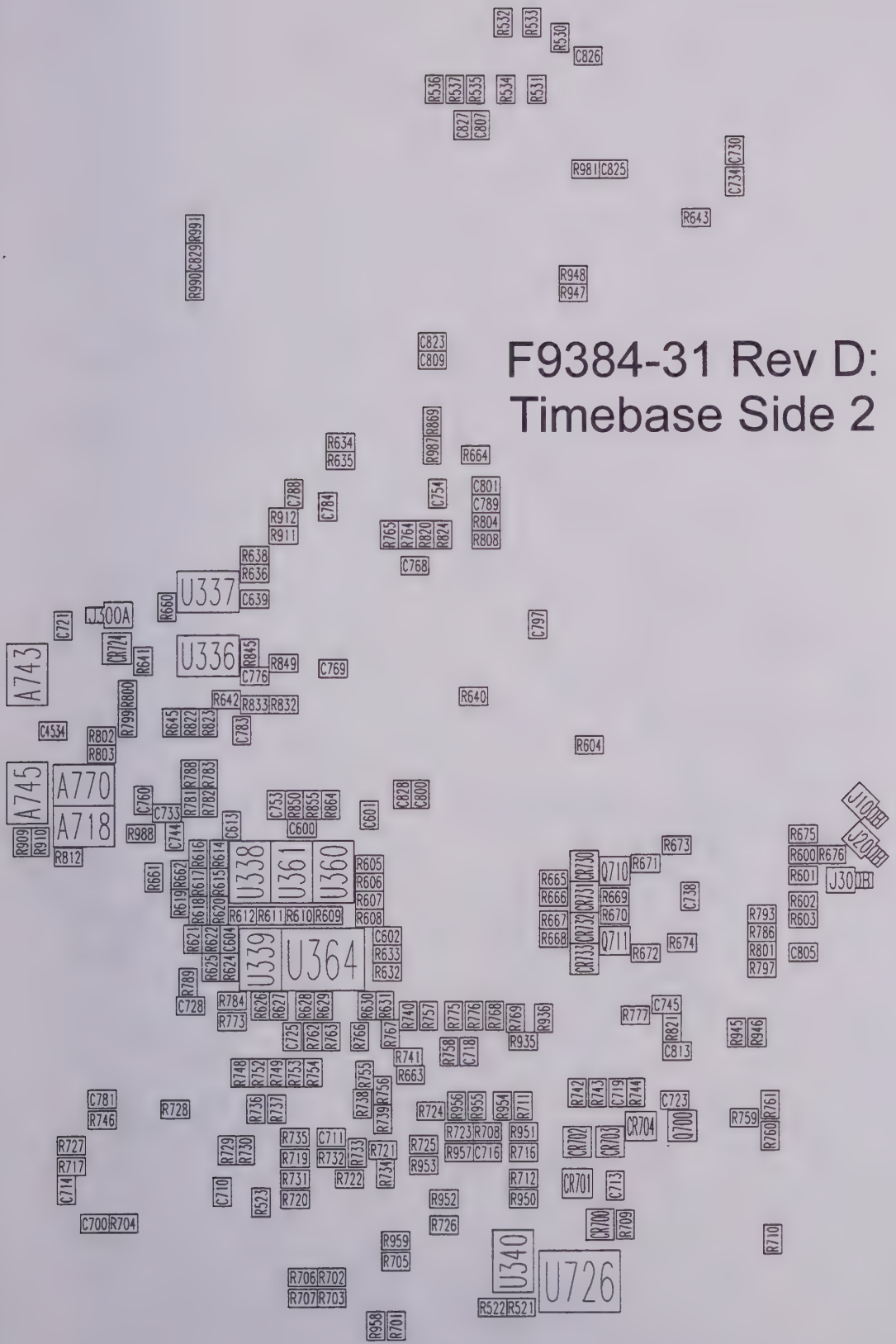
1N4005
BAV99
BA682
BFS20
BFT25A
BC858C
SM74HCT273
SM74HC594-PS
SM74HC157
SM74HC367
SM10EL57
SM10EL58
SM10EL32
SM10EL33
SM10EL11
SM1x12-13-ST-F-EDGE
SM241C16B
DL-1L6-20
NO-DELAY-5nS
DL-1L6-15
DL-1L6-15
F9384-31 Rev D:
Timebase Side 1


F9384-31 Rev D:
Timebase Side 2
U337
U336
U338
U361
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U364
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A770
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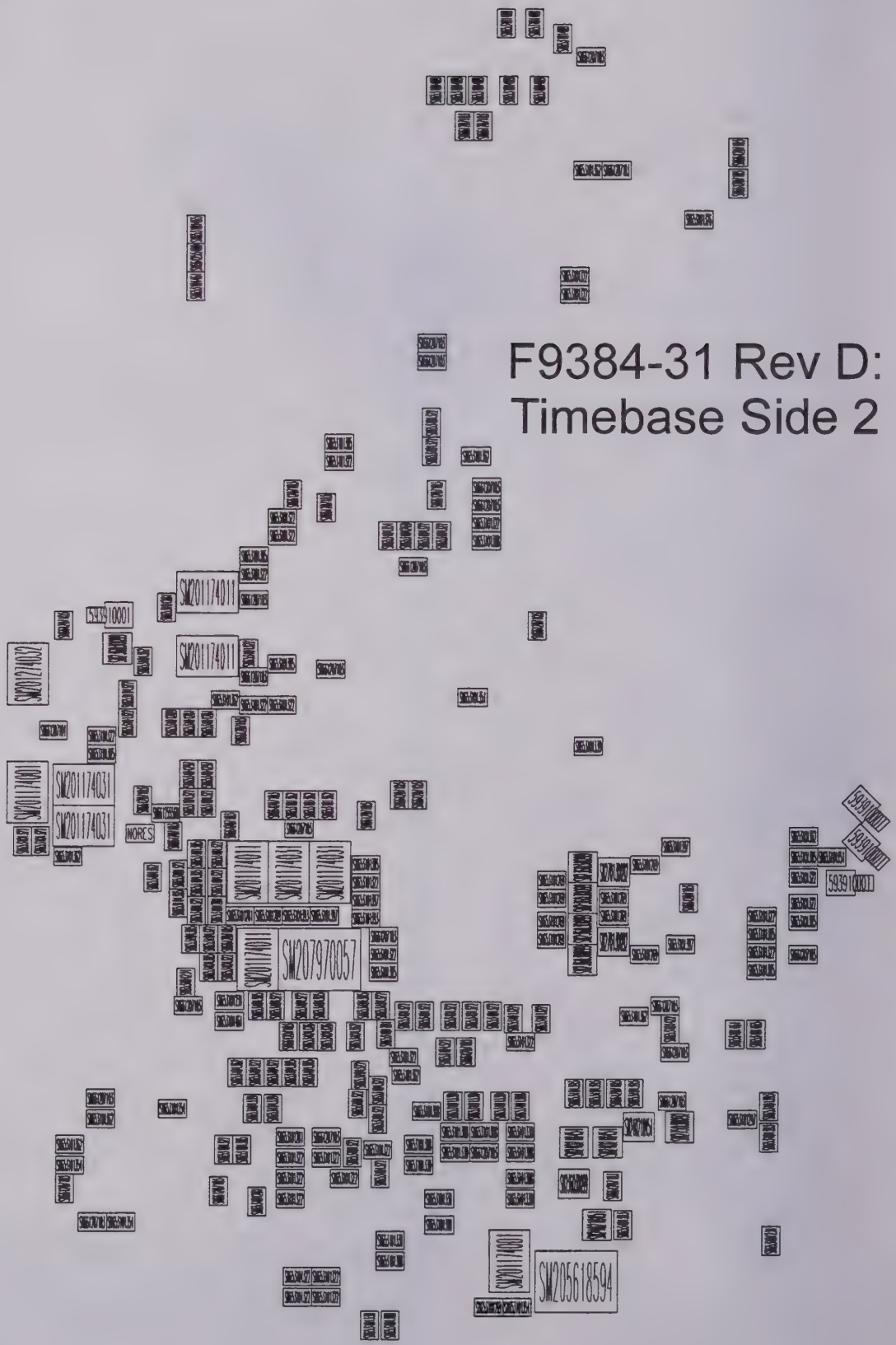
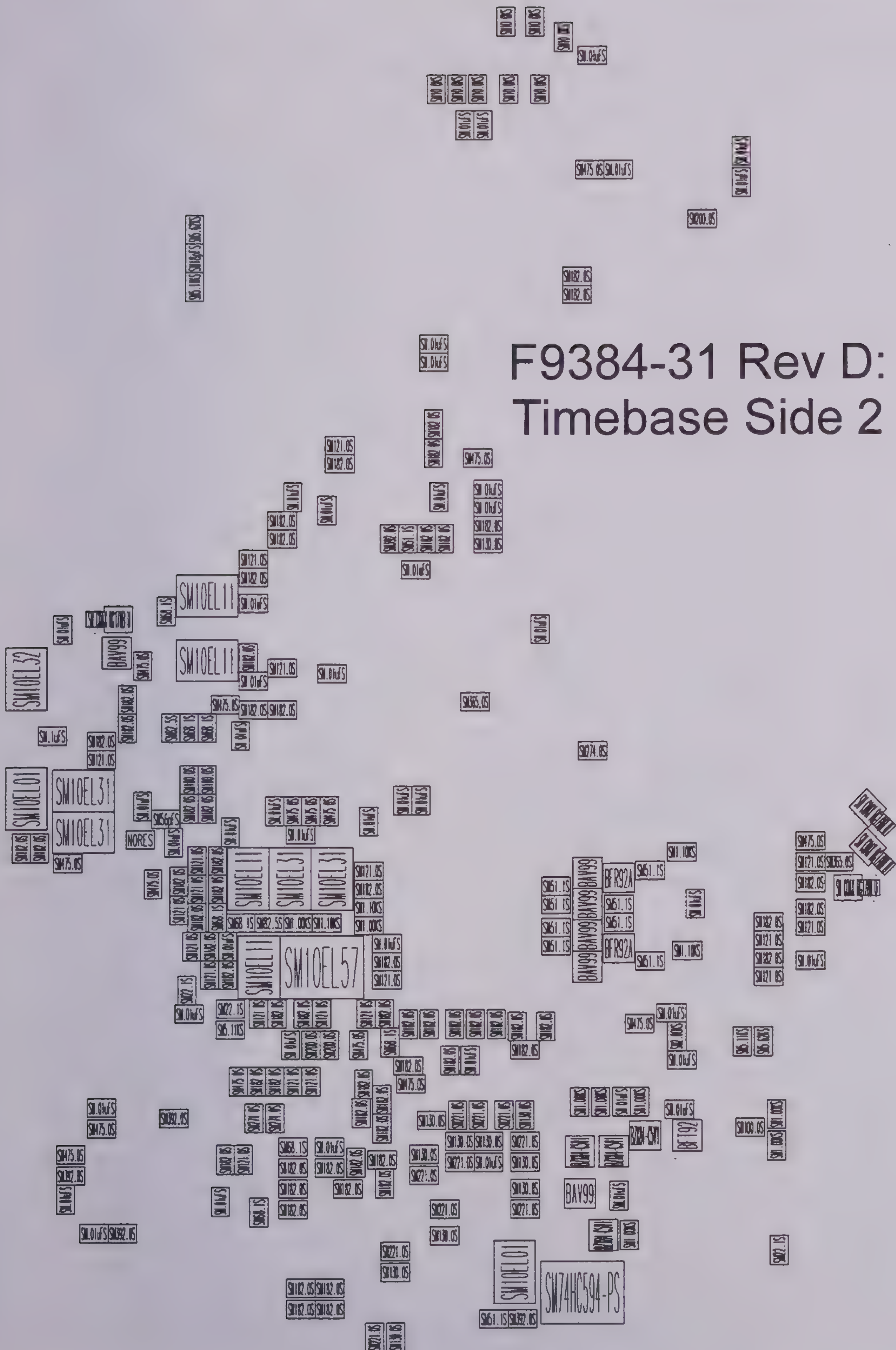
J300A
J10
J20
J30



F9384-31 Rev D:
Timebase Side 2

F9384-31 Rev D:
Timebase Side 2



PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
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A2	SM200178138	SM74HCT138
A3	SM200178030	SM74HCT30
A4	SM200178138	SM74HCT138
A5	SM200178138	SM74HCT138
A6	SM206260858	SMADC0858
A7	SM207970351	SM74HC4351
A8	SM206070584	SMPCD8584
A9	SM207978251	SM74HCT251
A10	SM200178138	SM74HCT138
A11	SM205108016	SM24LC16B
A12	SM206885245	SM74ABT245
A13	SM200178000	SM74HCT00
A14	SM206885245	SM74ABT245
A15	SM207171244	SM74ABT244
A16	SM205045357	CHEMIN-A
A17	SM205045358	ROUTE3-C
A18	SM205045355	RUELLE-A
A19	SM205045359	ARTERE-B
A20	SM205045354	AVENUE-A
A21	SM205045350	ROUTE1-A
A22	SM205045352	ROUTE2-B
A23	SM205045351	ROUTE2-A
A24	SM207171244	SM74ABT244
A25	SM207171244	SM74ABT244
A26	MCL404	MCL404
A27	SM207171244	SM74ABT244
A28	SM205045300	MIMOSA-A
A29	SM207972157	SM74F157A
A30	SM207280703	SMDAC703
A31	SM200169191	SM74F191
A32	SM200169191	SM74F191
A33	SM200169191	SM74F191
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A35	SM200169191	SM74F191
A36	SM207970139	SM74F139
A37	SM200278040	SM74HCT4040
A39	SM206884623	SM74ABT623
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A41	SM207970139	SM74F139
A42	SM200178374	SM74HCT374
A43	SM200178074	SM74HCT74
A44	SM200178273	SM74HCT273
A45	SM208570805	SM78L05
A202	SM208870339	SMLM339
A203	208124003	7912
A204	208123002	7812
A205	SM208470347	SMLF347
A206	SM207770201	SMDG201-PS
A207	SM208470347	SMLF347
A208	SM207770201	SMDG201-PS
A209	208124003	7912
A210	208123002	7812
A211	SM208470347	SMLF347
A212	SM207770201	SMDG201-PS
A213	SM208470324	SMLM324
A214	SM208470347	SMLF347
A215	SM207770201	SMDG201-PS
A400	208124003	7912-SP
A402	208123002	7812-SP
A700	SM205618594	SM74HC594-PS
A701	SM200178002	SM74HCT02
A702	SM207978251	SM74HCT251
A703	SM201274033	SM10EL33
A705	SM206970457	SM10E457
A706	SM201164104	SM10E104
A707	SM205618594	SM74HC594-PS
A708	SM200178273	SM74HCT273
A709	SM200167102	SM10H102
A710	SM201174011	SM10EL11
A711	SM201164131	SM10E131
A712	SM207960157	SM10E157
A713	SM201570016	SM10EL16
A714	SM200167164	SM10H164
A717	SM201174001	SM10EL01
A718	SM201174031	SM10EL31
A723	SM201274032	SM10EL32
A724	MST412	MST412
A726	SM207360125	SM10125
A727	SM200169016	SM10E016
A728	SM200178002	SM74HCT02
A734	SM207360125	SM10125
A735	SM200169016	SM10E016
A736	SM208030245	SMSL3245
A737	SM205618594	SM74HC594-PS
A739	SM208470353	SMLF353

PART: F9384-31 **DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD**

Location	Part Number	Description	Location	Part Number	Description
A740	SM208570078	SM78L12	A2010	SM208470705	SMAD705
A741	SM201274032	SM10EL32	A2011	SM208880337	SM337L
A742	SM200169016	SM10E016	A3000	SM208470111	SMCLC111
A743	SM201274032	SM10EL32	A3001	SM208470705	SMAD705
A744	SM208880079	SM79L12	A3002	SM208480640	SMOPA640
A745	SM201174001	SM10EL01	A3003	HFE624	HFE624
A746	SM207360125	SM10125	A3004	SM208470705	SMAD705
A748	SM200167102	SM10H102	A3005	SM207770442	SMDG442-PS
A749	MTB411	MTB411	A3006	SM208870339	SMLM339
A756	SM207367124	SM10H124	A3007	SM289772003	SMULN2003
A757	SM200178074	SM74HCT74	A3008	SM205618594	SM74HC594-PS
A758	SM201174031	SM10EL31	A3009	SM205618594	SM74HC594-PS
A759	SM207170367	SM74HC367	A3010	SM208470705	SMAD705
A760	SM201174031	SM10EL31	A3011	SM208880337	SM337L
A761	SM205618594	SM74HC594-PS	A4000	SM208470111	SMCLC111
A765	SM201174031	SM10EL31	A4001	SM208470705	SMAD705
A769	SM207367125	SM10H125	A4002	SM208480640	SMOPA640
A770	SM201174031	SM10EL31	A4003	HFE624	HFE624
A771	SM201174031	SM10EL31	A4004	SM208470705	SMAD705
A772	SM201174031	SM10EL31	A4005	SM207770442	SMDG442-PS
A773	SM208570805	SM78L05	A4006	SM208870339	SMLM339
A1000	SM208470111	SMCLC111	A4007	SM289772003	SMULN2003
A1001	SM208470705	SMAD705	A4008	SM205618594	SM74HC594-PS
A1002	SM208480640	SMOPA640	A4009	SM205618594	SM74HC594-PS
A1003	HFE624	HFE624	A4010	SM208470705	SMAD705
A1004	SM208470705	SMAD705	A4011	SM208880337	SM337L
A1005	SM207770442	SMDG442-PS	A5000	SM208470705	SMAD705
A1006	SM208870339	SMLM339	A5001	SM208971881	SMLM1881
A1007	SM289772003	SMULN2003	A5002	SM208470037	SMOP37
A1008	SM205618594	SM74HC594-PS	A5003	SM208470351	SMLF351
A1009	SM205618594	SM74HC594-PS	A5004	SM207770403	SMDG403-PS
A1010	SM208470705	SMAD705	A5005	SM207970508	SMDG508-PS
A1011	SM208880337	SM337L	A5006	SM205618594	SM74HC594-PS
A2000	SM208470111	SMCLC111	A5007	SM207770442	SMDG442-PS
A2001	SM208470705	SMAD705	A5008	SM205618594	SM74HC594-PS
A2002	SM208480640	SMOPA640	A5009	SM205618594	SM74HC594-PS
A2003	HFE624	HFE624	A5010	MTR408	MTR408
A2004	SM208470705	SMAD705	A5011	MTR408	MTR408
A2005	SM207770442	SMDG442-PS	A5012	SM205618594	SM74HC594-PS
A2006	SM208870339	SMLM339	A5013	SM205618594	SM74HC594-PS
A2007	SM289772003	SMULN2003	A5014	MTR408	MTR408
A2008	SM205618594	SM74HC594-PS	A5015	MTR408	MTR408
A2009	SM205618594	SM74HC594-PS	A5016	SM205618594	SM74HC594-PS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description	Location	Part Number	Description
A5017	MTR408	MTR408	C36	SM661207103	SM.01uFS
A5018	SM201570016	SM10EL16-PS	C37	SM661207103	SM.01uFS
A5019	SM205618594	SM74HC594-PS	C38	SM661207103	SM.01uFS
A5020	SM205618594	SM74HC594-PS	C39	SM661207103	SM.01uFS
A5021	SM207978153	SM74HCT153-PS	C40	SM661207103	SM.01uFS
A5022	SM208870339	SMLM339	C41	SM661207104	SM.1uFS
A6000	SM208470353	SMLF353	C42	SM661207103	SM.01uFS
BR1	BRIDGE	BRIDGE-026	C43	SM661207103	SM.01uFS
BZ700	530040007	TMB-05	C44	SM661207103	SM.01uFS
C1	SM661207103	SM.01uFS	C45	SM661207104	SM.1uFS
C2	SM661207104	SM.1uFS	C46	146544471	470uF-25VALRA
C3	SM661207103	SM.01uFS	C47	SM666247106	SM10uF-25V
C4	SM661207103	SM.01uFS	C48	SM666247106	SM10uF-25V
C5	SM661207103	SM.01uFS	C49	SM661207103	SM.01uFS
C6	SM661255181	SM180pFS	C50	SM666327225	SM2.2uF-20V
C7	SM661207104	SM.1uFS	C51	SM661207104	SM.1uFS
C8	SM661207103	SM.01uFS	C52	SM661207104	SM.1uFS
C9	SM661207103	SM.01uFS	C53	SM661207104	SM.1uFS
C10	SM661207103	SM.01uFS	C54	SM661207104	SM.1uFS
C11	SM661207103	SM.01uFS	C55	SM661207104	SM.1uFS
C12	SM661207103	SM.01uFS	C56	SM661207104	SM.1uFS
C13	SM666247106	SM10uF-25V	C57	SM661207104	SM.1uFS
C14	SM661207103	SM.01uFS	C58	SM661207104	SM.1uFS
C15	SM661207103	SM.01uFS	C60	SM666327225	SM2.2uF-20V
C16	SM661207103	SM.01uFS	C62	SM666377226	SM22uF-15V
C17	SM666247106	SM10uF-25V	C63	SM666377226	SM22uF-15V
C18	SM661207103	SM.01uFS	C64	SM661207104	SM.1uFS
C19	SM661207103	SM.01uFS	C81	SM661286103	SM.01uF
C20	SM661207103	SM.01uFS	C82	SM666377226	SM22uF-15V
C21	SM661207103	SM.01uFS	C90	SM666377226	SM22uF-15V
C22	SM661207103	SM.01uFS	C200	SM661207103	SM.01uFS
C23	SM666377226	SM22uF-15V	C201	SM661207103	SM.01uFS
C24	SM666377226	SM22uF-15V	C202	SM661207104	SM.1uFS
C25	SM661207103	SM.01uFS	C203	SM661207103	SM.01uFS
C26	SM661207103	SM.01uFS	C204	SM666327225	SM2.2uF-20V
C27	SM661207103	SM.01uFS	C205	SM661207103	SM.01uFS
C28	SM661207103	SM.01uFS	C206	SM661207103	SM.01uFS
C29	SM661207103	SM.01uFS	C207	SM661726103	SM.01uF-NPO
C30	SM661207103	SM.01uFS	C208	SM661207103	SM.01uFS
C31	SM661207103	SM.01uFS	C209	SM661207103	SM.01uFS
C32	SM661207103	SM.01uFS	C210	SM661207103	SM.01uFS
C33	SM661207103	SM.01uFS	C211	SM661726103	SM.01uF-NPO
C34	SM661207103	SM.01uFS	C212	SM661726103	SM.01uF-NPO
C35	SM661207103	SM.01uFS	C213	SM666327225	SM2.2uF-20V

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description	Location	Part Number	Description
C214	SM666327225	SM2.2uF-20V	C601	SM661207103	SM.01uFS
C215	SM666327225	SM2.2uF-20V	C602	SM661207103	SM.01uFS
C216	SM661726103	SM.01uF-NPO	C604	SM661207103	SM.01uFS
C217	SM661726103	SM.01uF-NPO	C613	SM661207103	SM.01uFS
C218	SM661207103	SM.01uFS	C639	SM661207103	SM.01uFS
C219	SM661726103	SM.01uF-NPO	C700	SM661207103	SM.01uFS
C220	SM661726103	SM.01uF-NPO	C702	SM661207103	SM.01uFS
C221	SM666327225	SM2.2uF-20V	C703	SM661207103	SM.01uFS
C222	SM666327225	SM2.2uF-20V	C704	SM661207103	SM.01uFS
C223	SM666327225	SM2.2uF-20V	C706	SM158240201	SM1-5pF
C224	SM661726103	SM.01uF-NPO	C708	SM661255560	SM56pFS
C225	SM661726103	SM.01uF-NPO	C710	SM661207103	SM.01uFS
C226	SM661207103	SM.01uFS	C711	SM661207103	SM.01uFS
C227	SM661207103	SM.01uFS	C713	SM661207103	SM.01uFS
C228	SM661726103	SM.01uF-NPO	C714	SM661207103	SM.01uFS
C229	SM661726103	SM.01uF-NPO	C716	SM661207103	SM.01uFS
C230	SM661207103	SM.01uFS	C718	SM661207103	SM.01uFS
C231	SM666327225	SM2.2uF-20V	C719	SM661207103	SM.01uFS
C232	SM661726103	SM.01uF-NPO	C720	SM661207103	SM.01uFS
C233	SM661726103	SM.01uF-NPO	C721	SM661207103	SM.01uFS
C234	SM661207103	SM.01uFS	C722	SM661207103	SM.01uFS
C235	SM661207103	SM.01uFS	C723	SM661207103	SM.01uFS
C236	SM666327225	SM2.2uF-20V	C724	SM661207103	SM.01uFS
C237	SM661726103	SM.01uF-NPO	C725	SM661207103	SM.01uFS
C238	SM661726103	SM.01uF-NPO	C728	SM661207103	SM.01uFS
C239	SM661207103	SM.01uFS	C730	SM661207103	SM.01uFS
C240	SM666327225	SM2.2uF-20V	C732	SM661207103	SM.01uFS
C241	SM666327225	SM2.2uF-20V	C733	SM661255560	SM56pFS
C242	SM666327225	SM2.2uF-20V	C734	SM661207103	SM.01uFS
C255	SM666237476	SM47uF-6V	C735	SM661207103	SM.01uFS
C262	SM666387336	SM33uF-10V	C737	SM661207103	SM.01uFS
C263	SM661207103	SM.01uFS	C738	SM661207103	SM.01uFS
C265	SM661207103	SM.01uFS	C739	SM661207103	SM.01uFS
C266	SM666387336	SM33uF-10V	C744	SM661207103	SM.01uFS
C267	SM661207103	SM.01uFS	C745	SM661207103	SM.01uFS
C268	SM661207103	SM.01uFS	C752	SM661207103	SM.01uFS
C269	SM661207103	SM.01uFS	C753	SM661207103	SM.01uFS
C270	SM666327225	SM2.2uF-20V	C754	SM661207103	SM.01uFS
C271	SM661255102	SM1000pFS	C756	SM661207103	SM.01uFS
C272	SM661207103	SM.01uFS	C758	SM661255056	SM5.6pFS
C400	146574227	220uF-25VALRA	C760	SM661207103	SM.01uFS
C403	146554476	47uF-25VALRA	C761	SM661207103	SM.01uFS
C600	SM661207103	SM.01uFS	C765	SM661255101	SM100pFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C768	SM661207103	SM.01uFS
C769	SM661207103	SM.01uFS
C770	SM661207103	SM.01uFS
C771	SM661207103	SM.01uFS
C773	SM661207103	SM.01uFS
C774	SM661207103	SM.01uFS
C776	SM661207103	SM.01uFS
C777	SM661207103	SM.01uFS
C778	SM661446474	SM.47uF
C779	SM666327225	SM2.2uF-20V
C780	SM661207103	SM.01uFS
C781	SM661207103	SM.01uFS
C783	SM661207103	SM.01uFS
C784	SM661207103	SM.01uFS
C785	SM666327225	SM2.2uF-20V
C786	SM661446474	SM.47uF
C787	SM661207103	SM.01uFS
C788	SM661207103	SM.01uFS
C789	SM661207103	SM.01uFS
C793	SM661207103	SM.01uFS
C795	SM661207103	SM.01uFS
C797	SM661207103	SM.01uFS
C798	SM661207103	SM.01uFS
C799	SM661207103	SM.01uFS
C800	SM661207103	SM.01uFS
C801	SM661207103	SM.01uFS
C802	SM661207103	SM.01uFS
C803	SM661207103	SM.01uFS
C805	SM661207103	SM.01uFS
C807	SM661207103	SM.01uFS
C809	SM661207103	SM.01uFS
C813	SM661207103	SM.01uFS
C820	SM661207103	SM.01uFS
C823	SM661207103	SM.01uFS
C824	SM661207103	SM.01uFS
C825	SM661207103	SM.01uFS
C826	SM661207103	SM.01uFS
C827	SM661207103	SM.01uFS
C828	SM661207103	SM.01uFS
C829	SM661255180	SM18pFS
C830	SM661207103	SM.01uFS
C831	SM661207103	SM.01uFS
C832	SM666327225	SM2.2uF-20V
C833	SM661207103	SM.01uFS
C1001	SM661207104	SM.1uFS
C1002	SM661207104	SM.1uFS
C1003	SM158240203	SM5-18pF
C1005	SM661207103	SM.01uFS
C1006	SM661545150	SM15pFS_500V
C1007	SM661535620	SM62pFS_5%
C1008	SM661207103	SM.01uFS
C1009	SM661207103	SM.01uFS
C1010	SM661207103	SM.01uFS
C1011	SM661207103	SM.01uFS
C1012	SM661207103	SM.01uFS
C1013	SM661540033	SM3.3pFS_500V
C1014	SM661545150	SM15pFS_500V
C1015	SM661255100	SM10pFS
C1016	SM661255101	SM100pFS
C1017	SM661526561	SM560pF_500V
C1018	SM661255101	SM100pFS
C1019	SM661207103	SM.01uFS
C1021	SM661207103	SM.01uFS
C1022	SM158240203	SM5-18pF
C1024	SM661207103	SM.01uFS
C1025	SM661207103	SM.01uFS
C1026	SM661207103	SM.01uFS
C1028	SM661255101	SM100pFS
C1029	SM661207103	SM.01uFS
C1030	SM661207103	SM.01uFS
C1031	SM661207223	SM.022uFS
C1032	SM661207223	SM.022uFS
C1034	SM158240200	SM0.6-2.5pF
C1035	SM661207103	SM.01uFS
C1036	SM661207103	SM.01uFS
C1038	SM661207103	SM.01uFS
C1039	SM661207103	SM.01uFS
C1041	SM661207103	SM.01uFS
C1042	SM661255821	SM820pFS
C1043	SM661207103	SM.01uFS
C1044	SM661255101	SM100pFS
C1045	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C1046	SM661207103	SM.01uFS
C1047	SM661207103	SM.01uFS
C1048	SM661207103	SM.01uFS
C1049	SM661255100	SM10pFS
C1050	SM661207103	SM.01uFS
C1051	SM661207103	SM.01uFS
C1052	SM661207103	SM.01uFS
C1053	SM661207103	SM.01uFS
C1054	SM661207103	SM.01uFS
C1055	SM661207103	SM.01uFS
C1056	SM661207103	SM.01uFS
C1057	SM661207104	SM.1uFS
C1058	SM661207103	SM.01uFS
C1059	SM661207103	SM.01uFS
C1060	SM661207104	SM.1uFS
C1061	SM661207103	SM.01uFS
C1062	SM661207103	SM.01uFS
C1063	SM661207104	SM.1uFS
C1065	SM666327225	SM2.2uF-20V
C1066	SM661207103	SM.01uFS
C1067	SM661207103	SM.01uFS
C1068	SM666327225	SM2.2uF-20V
C1069	SM666327225	SM2.2uF-20V
C1070	SM666327225	SM2.2uF-20V
C1071	SM666327225	SM2.2uF-20V
C1072	SM661207103	SM.01uFS
C1073	SM661207103	SM.01uFS
C1074	SM661207103	SM.01uFS
C1075	SM661207104	SM.1uFS
C1076	SM661207103	SM.01uFS
C1077	SM661207103	SM.01uFS
C1079	SM661207104	SM.1uFS
C1086	SM666327225	SM2.2uF-20V
C1087	SM661255101	SM100pFS
C1089	SM661207102	SM.001uFS
C1090	SM661207103	SM.01uFS
C1092	SM661207103	SM.01uFS
C1095	SM661207103	SM.01uFS
C1096	SM661207103	SM.01uFS
C1098	SM661256120	SM12pFS
C1099	SM661255470	SM47pFS
C1500	SM661207103	SM.01uFS
C1501	SM661207103	SM.01uFS
C1502	SM158240200	SM0.6-2.5pF
C1503	SM158240200	SM0.6-2.5pF
C1504	SM661286103	SM.01uF
C1505	SM661207103	SM.01uFS
C1506	SM661286103	SM.01uF
C1507	SM661286103	SM.01uF
C1508	SM661207103	SM.01uFS
C1509	SM661286103	SM.01uF
C1510	SM666257336	SM33uF-16V
C1511	SM661286103	SM.01uF
C1512	SM661207103	SM.01uFS
C1513	SM661286103	SM.01uF
C1514	SM661286103	SM.01uF
C1515	SM661207103	SM.01uFS
C1516	SM661286103	SM.01uF
C1517	SM661207103	SM.01uFS
C1518	SM661207103	SM.01uFS
C1520	SM661207103	SM.01uFS
C1521	SM666257336	SM33uF-16V
C1522	SM666327225	SM2.2uF-20V
C1523	146574227	220uF-25VALRA
C1530	SM661207104	SM.1uFS
C1531	SM661207104	SM.1uFS
C1532	SM661207104	SM.1uFS
C1533	SM661207104	SM.1uFS
C1534	SM661207104	SM.1uFS
C1535	SM661207104	SM.1uFS
C1536	SM661207104	SM.1uFS
C1537	SM661207104	SM.1uFS
C1538	SM661207103	SM.01uFS
C1539	SM661207103	SM.01uFS
C1540	SM661207103	SM.01uFS
C1541	SM661207103	SM.01uFS
C1542	SM661207103	SM.01uFS
C1544	SM661207103	SM.01uFS
C1545	SM661207103	SM.01uFS
C1546	SM661207103	SM.01uFS
C1547	SM661207103	SM.01uFS
C1548	SM661207103	SM.01uFS
C1549	SM661207104	SM.1uFS
C1550	SM661207103	SM.01uFS
C1551	SM661207103	SM.01uFS
C1552	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C1553	SM661207104	SM.1uFS
C1554	SM661207103	SM.01uFS
C1556	SM661207104	SM.1uFS
C1557	SM661207104	SM.1uFS
C1558	SM661207104	SM.1uFS
C1559	SM661207104	SM.1uFS
C1560	SM661207104	SM.1uFS
C1561	SM661207104	SM.1uFS
C1562	SM661207104	SM.1uFS
C1563	SM661207104	SM.1uFS
C1564	SM666237476	SM47uF-6V
C1565	SM666237476	SM47uF-6V
C1566	SM666267227	SM220uF-10V
C1567	SM666267227	SM220uF-10V
C1568	SM661207104	SM.1uFS
C1569	SM661207104	SM.1uFS
C1570	SM661207104	SM.1uFS
C1571	SM666267227	SM220uF-10V
C1572	SM661207104	SM.1uFS
C1573	SM661207104	SM.1uFS
C1574	SM661207104	SM.1uFS
C1575	SM661207103	SM.01uFS
C1576	SM661207104	SM.1uFS
C1577	SM661207104	SM.1uFS
C1578	SM661207103	SM.01uFS
C1580	SM661207103	SM.01uFS
C1581	SM661207103	SM.01uFS
C1582	SM661207103	SM.01uFS
C1583	SM661207104	SM.1uFS
C1584	SM661207103	SM.01uFS
C1600	SM661255039	SM3.9pFS
C1601	158849009	0.5-2.5pF
C1602	SM661207103	SM.01uFS
C2001	SM661207104	SM.1uFS
C2002	SM661207104	SM.1uFS
C2003	SM158240203	SM5-18pF
C2005	SM661207103	SM.01uFS
C2006	SM661545150	SM15pFS_500V
C2007	SM661535620	SM62pFS_5%
C2008	SM661207103	SM.01uFS
C2009	SM661207103	SM.01uFS
C2010	SM661207103	SM.01uFS

Location	Part Number	Description
C2011	SM661207103	SM.01uFS
C2012	SM661207103	SM.01uFS
C2013	SM661540033	SM3.3pFS_500V
C2014	SM661545150	SM15pFS_500V
C2015	SM661255100	SM10pFS
C2016	SM661255101	SM100pFS
C2017	SM661526561	SM560pF_500V
C2018	SM661255101	SM100pFS
C2019	SM661207103	SM.01uFS
C2021	SM661207103	SM.01uFS
C2022	SM158240203	SM5-18pF
C2024	SM661207103	SM.01uFS
C2025	SM661207103	SM.01uFS
C2026	SM661207103	SM.01uFS
C2028	SM661255101	SM100pFS
C2029	SM661207103	SM.01uFS
C2030	SM661207103	SM.01uFS
C2031	SM661207223	SM.022uFS
C2032	SM661207223	SM.022uFS
C2034	SM158240200	SM0.6-2.5pF
C2035	SM661207103	SM.01uFS
C2036	SM661207103	SM.01uFS
C2038	SM661207103	SM.01uFS
C2039	SM661207103	SM.01uFS
C2041	SM661207103	SM.01uFS
C2042	SM661255821	SM820pFS
C2043	SM661207103	SM.01uFS
C2044	SM661255101	SM100pFS
C2045	SM661207103	SM.01uFS
C2046	SM661207103	SM.01uFS
C2047	SM661207103	SM.01uFS
C2048	SM661207103	SM.01uFS
C2049	SM661255100	SM10pFS
C2050	SM661207103	SM.01uFS
C2051	SM661207103	SM.01uFS
C2052	SM661207103	SM.01uFS
C2053	SM661207103	SM.01uFS
C2054	SM661207103	SM.01uFS
C2055	SM661207103	SM.01uFS
C2056	SM661207103	SM.01uFS
C2057	SM661207104	SM.1uFS
C2058	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C2059	SM661207103	SM.01uFS
C2060	SM661207104	SM.1uFS
C2061	SM661207103	SM.01uFS
C2062	SM661207103	SM.01uFS
C2063	SM661207104	SM.1uFS
C2065	SM666327225	SM2.2uF-20V
C2066	SM661207103	SM.01uFS
C2067	SM661207103	SM.01uFS
C2068	SM666327225	SM2.2uF-20V
C2069	SM666327225	SM2.2uF-20V
C2070	SM666327225	SM2.2uF-20V
C2071	SM666327225	SM2.2uF-20V
C2072	SM661207103	SM.01uFS
C2073	SM661207103	SM.01uFS
C2074	SM661207103	SM.01uFS
C2075	SM661207104	SM.1uFS
C2076	SM661207103	SM.01uFS
C2077	SM661207103	SM.01uFS
C2079	SM661207104	SM.1uFS
C2086	SM666327225	SM2.2uF-20V
C2087	SM661255101	SM100pFS
C2089	SM661207102	SM.001uFS
C2090	SM661207103	SM.01uFS
C2092	SM661207103	SM.01uFS
C2095	SM661207103	SM.01uFS
C2096	SM661207103	SM.01uFS
C2098	SM661256120	SM12pFS
C2099	SM661255470	SM47pFS
C2500	SM661207103	SM.01uFS
C2501	SM661207103	SM.01uFS
C2502	SM158240200	SM0.6-2.5pF
C2503	SM661286103	SM.01uF
C2504	SM661255102	SM1000pFS
C2505	SM661207103	SM.01uFS
C2506	SM661207103	SM.01uFS
C2507	SM661286103	SM.01uF
C2508	SM661255102	SM1000pFS
C2509	SM661255102	SM1000pFS
C2510	SM661286103	SM.01uF
C2511	SM661207103	SM.01uFS
C2512	SM661207103	SM.01uFS
C2513	SM661286103	SM.01uF
C2514	SM661255102	SM1000pFS
C2515	SM661286103	SM.01uF
C2516	SM661207103	SM.01uFS
C2517	SM661286103	SM.01uF
C2518	SM661286103	SM.01uF
C2519	SM661207103	SM.01uFS
C2520	SM661286103	SM.01uF
C2521	SM661207103	SM.01uFS
C2522	SM661207103	SM.01uFS
C2523	SM661286103	SM.01uF
C2524	SM661286103	SM.01uF
C2525	SM661207103	SM.01uFS
C2526	SM661207103	SM.01uFS
C2527	SM661286103	SM.01uF
C2528	SM661286103	SM.01uF
C2529	SM661207104	SM.1uFS
C2530	SM661207104	SM.1uFS
C2531	SM661207104	SM.1uFS
C2532	SM661207104	SM.1uFS
C2533	SM661207103	SM.01uFS
C2534	SM661207103	SM.01uFS
C2535	SM661207103	SM.01uFS
C2536	SM661207103	SM.01uFS
C2537	SM661207103	SM.01uFS
C2538	SM661207103	SM.01uFS
C2540	SM661207103	SM.01uFS
C2541	SM661207104	SM.1uFS
C2542	SM661207104	SM.1uFS
C2543	SM661207104	SM.1uFS
C2544	SM661207104	SM.1uFS
C2545	SM661207103	SM.01uFS
C2546	SM661207103	SM.01uFS
C2547	SM661286103	SM.01uF
C2548	SM661286103	SM.01uF
C2550	SM661286103	SM.01uF
C2551	SM661286103	SM.01uF
C2552	SM661286103	SM.01uF
C2553	SM661286103	SM.01uF
C2554	SM661207103	SM.01uFS
C2555	SM661207103	SM.01uFS
C2556	SM661207104	SM.1uFS
C2557	SM661207103	SM.01uFS
C2558	SM661207103	SM.01uFS
C2559	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C2560	SM661207104	SM.1uFS
C2561	SM661207103	SM.01uFS
C2562	SM661207103	SM.01uFS
C2563	SM661207103	SM.01uFS
C2564	SM661207104	SM.1uFS
C2565	SM661207104	SM.1uFS
C2566	SM661207104	SM.1uFS
C2567	SM661207104	SM.1uFS
C2568	SM666237476	SM47uF-6V
C2569	SM666267227	SM220uF-10V
C2570	SM666267227	SM220uF-10V
C2571	SM666237476	SM47uF-6V
C2572	SM661207104	SM.1uFS
C2573	SM661207104	SM.1uFS
C2574	SM661207104	SM.1uFSC2575
C2576	SM661207103	SM.01uFS
C2577	SM661207104	SM.1uFS
C2578	SM661207104	SM.1uFS
C2579	SM661207104	SM.1uFS
C2580	SM661207104	SM.1uFS
C2581	SM661207104	SM.1uFS
C2582	SM661207104	SM.1uFS
C2583	SM661207104	SM.1uFS
C2584	SM661207104	SM.1uFS
C2585	SM661207104	SM.1uFS
C2586	SM661207103	SM.01uFS
C2588	SM661207103	SM.01uFS
C2589	SM661207103	SM.01uFS
C2590	SM661207103	SM.01uFS
C2595	SM661286103	SM.01uF
C2600	SM661255039	SM3.9pFS
C2601	158849009	0.5-2.5pF
C2602	SM661207103	SM.01uFS
C3001	SM661207104	SM.1uFS
C3002	SM661207104	SM.1uFS
C3003	SM158240203	SM5-18pF
C3005	SM661207103	SM.01uFS
C3006	SM661545150	SM15pFS_500V
C3007	SM661535620	SM62pFS_5%
C3008	SM661207103	SM.01uFS
C3009	SM661207103	SM.01uFS
C3010	SM661207103	SM.01uFS
C3011	SM661207103	SM.01uFS

Location	Part Number	Description
C3012	SM661207103	SM.01uFS
C3013	SM661540033	SM3.3pFS_500V
C3014	SM661545150	SM15pFS_500V
C3015	SM661255100	SM10pFS
C3016	SM661255101	SM100pFS
C3017	SM661526561	SM560pF_500V
C3018	SM661255101	SM100pFS
C3019	SM661207103	SM.01uFS
C3021	SM661207103	SM.01uFS
C3022	SM158240203	SM5-18pF
C3024	SM661207103	SM.01uFS
C3025	SM661207103	SM.01uFS
C3026	SM661207103	SM.01uFS
C3028	SM661255101	SM100pFS
C3029	SM661207103	SM.01uFS
C3030	SM661207103	SM.01uFS
C3031	SM661207223	SM.022uFS
C3032	SM661207223	SM.022uFS
C3034	SM158240200	SM0.6-2.5pF
C3035	SM661207103	SM.01uFS
C3036	SM661207103	SM.01uFS
C3038	SM661207103	SM.01uFS
C3039	SM661207103	SM.01uFS
C3041	SM661207103	SM.01uFS
C3042	SM661255821	SM820pFS
C3043	SM661207103	SM.01uFS
C3044	SM661255101	SM100pFS
C3045	SM661207103	SM.01uFS
C3046	SM661207103	SM.01uFS
C3047	SM661207103	SM.01uFS
C3048	SM661207103	SM.01uFS
C3049	SM661255100	SM10pFS
C3050	SM661207103	SM.01uFS
C3051	SM661207103	SM.01uFS
C3052	SM661207103	SM.01uFS
C3053	SM661207103	SM.01uFS
C3054	SM661207103	SM.01uFS
C3055	SM661207103	SM.01uFS
C3056	SM661207103	SM.01uFS
C3057	SM661207104	SM.1uFS
C3058	SM661207103	SM.01uFS
C3059	SM661207103	SM.01uFS
C3060	SM661207104	SM.1uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C3061	SM661207103	SM.01uFS
C3062	SM661207103	SM.01uFS
C3063	SM661207104	SM.1uFS
C3065	SM666327225	SM2.2uF-20V
C3066	SM661207103	SM.01uFS
C3067	SM661207103	SM.01uFS
C3068	SM666327225	SM2.2uF-20V
C3069	SM666327225	SM2.2uF-20V
C3070	SM666327225	SM2.2uF-20V
C3071	SM666327225	SM2.2uF-20V
C3072	SM661207103	SM.01uFS
C3073	SM661207103	SM.01uFS
C3074	SM661207103	SM.01uFS
C3075	SM661207104	SM.1uFS
C3076	SM661207103	SM.01uFS
C3077	SM661207103	SM.01uFS
C3079	SM661207104	SM.1uFS
C3086	SM666327225	SM2.2uF-20V
C3087	SM661255101	SM100pFS
C3089	SM661207102	SM.001uFS
C3090	SM661207103	SM.01uFS
C3092	SM661207103	SM.01uFS
C3095	SM661207103	SM.01uFS
C3096	SM661207103	SM.01uFS
C3098	SM661256120	SM12pFS
C3099	SM661255470	SM47pFS
C3500	SM158240200	SM0.6-2.5pF
C3502	SM661286103	SM.01uF
C3503	SM661207103	SM.01uFS
C3504	SM661286103	SM.01uF
C3505	SM661286103	SM.01uF
C3506	SM661207103	SM.01uFS
C3507	SM661286103	SM.01uF
C3508	SM661286103	SM.01uF
C3509	SM661207103	SM.01uFS
C3510	SM661286103	SM.01uF
C3511	SM661286103	SM.01uF
C3512	SM661207103	SM.01uFS
C3513	SM661286103	SM.01uF
C3514	SM661207103	SM.01uFS
C3515	SM661286103	SM.01uF
C3516	SM661286103	SM.01uF
C3517	SM661207103	SM.01uFS
C3518	146554476	47uF-25VALRA
C3519	146574227	220uF-25VALRA
C3520	SM661207103	SM.01uFS
C3521	SM661286103	SM.01uF
C3522	SM661286103	SM.01uF
C3523	SM661207103	SM.01uFS
C3524	SM661286103	SM.01uF
C3525	SM661286103	SM.01uF
C3526	SM661207103	SM.01uFS
C3527	SM661286103	SM.01uF
C3528	SM661286103	SM.01uF
C3529	SM661207103	SM.01uFS
C3530	SM661207103	SM.01uFS
C3531	SM661207104	SM.1uFS
C3532	SM661207104	SM.1uFS
C3533	SM661207104	SM.1uFS
C3534	SM661207104	SM.1uFS
C3535	SM661286103	SM.01uF
C3536	SM661286103	SM.01uF
C3537	SM661286103	SM.01uF
C3538	SM661286103	SM.01uF
C3539	SM661207103	SM.01uFS
C3540	SM661207103	SM.01uFS
C3541	SM661207103	SM.01uFS
C3543	SM661207103	SM.01uFS
C3544	SM661207103	SM.01uFS
C3545	SM661207103	SM.01uFS
C3546	SM661207104	SM.1uFS
C3547	SM661207104	SM.1uFS
C3548	SM661207104	SM.1uFS
C3549	SM661207104	SM.1uFS
C3550	SM661207103	SM.01uFS
C3551	SM661207103	SM.01uFS
C3552	SM661207103	SM.01uFS
C3553	SM661207103	SM.01uFS
C3554	SM661207103	SM.01uFS
C3555	SM661207103	SM.01uFS
C3556	SM661207103	SM.01uFS
C3557	SM661207103	SM.01uFS
C3558	SM661207104	SM.1uFS
C3559	SM661207103	SM.01uFS
C3560	SM661207103	SM.01uFS
C3561	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C3562	SM661207104	SM.1uFS
C3563	SM661207104	SM.1uFS
C3564	SM661207104	SM.1uFS
C3565	SM661207104	SM.1uFS
C3566	SM661207104	SM.1uFS
C3567	SM666237476	SM47uF-6V
C3568	SM661207104	SM.1uFS
C3569	SM661207104	SM.1uFS
C3570	SM661207104	SM.1uFS
C3571	SM661207104	SM.1uFS
C3572	SM666237476	SM47uF-6V
C3573	SM666267227	SM220uF-10V
C3574	SM661207104	SM.1uFS
C3575	SM661207104	SM.1uFS
C3576	SM661207104	SM.1uFS
C3579	SM661207104	SM.1uFS
C3580	SM661207104	SM.1uFS
C3581	SM661207104	SM.1uFS
C3582	SM666267227	SM220uF-10V
C3584	SM661207104	SM.1uFS
C3585	SM661207103	SM.01uFS
C3586	SM661207103	SM.01uFS
C3587	SM661207104	SM.1uFS
C3588	SM661207104	SM.1uFS
C3589	SM661207103	SM.01uFS
C3590	SM661207103	SM.01uFS
C3591	SM661207103	SM.01uFS
C3592	SM661207103	SM.01uFS
C3593	SM661207103	SM.01uFS
C3600	SM661255039	SM3.9pFS
C3601	158849009	0.5-2.5pF
C3602	SM661207103	SM.01uFS
C3610	SM661207103	SM.01uFS
C3620	SM158240200	SM0.6-2.5pF
C3621	SM158240200	SM0.6-2.5pF
C4001	SM661207104	SM.1uFS
C4002	SM661207104	SM.1uFS
C4003	SM158240203	SM5-18pF
C4005	SM661207103	SM.01uFS
C4006	SM661545150	SM15pFS_500V
C4007	SM661535620	SM62pFS_5%
C4008	SM661207103	SM.01uFS
C4009	SM661207103	SM.01uFS
C4010	SM661207103	SM.01uFS
C4011	SM661207103	SM.01uFS
C4012	SM661207103	SM.01uFS
C4013	SM661540033	SM3.3pFS_500V
C4014	SM661545150	SM15pFS_500V
C4015	SM661255100	SM10pFS
C4016	SM661255101	SM100pFS
C4017	SM661526561	SM560pF_500V
C4018	SM661255101	SM100pFS
C4019	SM661207103	SM.01uFS
C4021	SM661207103	SM.01uFS
C4022	SM158240203	SM5-18pF
C4024	SM661207103	SM.01uFS
C4025	SM661207103	SM.01uFS
C4026	SM661207103	SM.01uFS
C4028	SM661255101	SM100pFS
C4029	SM661207103	SM.01uFS
C4030	SM661207103	SM.01uFS
C4031	SM661207223	SM.022uFS
C4032	SM661207223	SM.022uFS
C4034	SM158240200	SM0.6-2.5pF
C4035	SM661207103	SM.01uFS
C4036	SM661207103	SM.01uFS
C4038	SM661207103	SM.01uFS
C4039	SM661207103	SM.01uFS
C4041	SM661207103	SM.01uFS
C4042	SM661255821	SM820pFS
C4043	SM661207103	SM.01uFS
C4044	SM661255101	SM100pFS
C4045	SM661207103	SM.01uFS
C4046	SM661207103	SM.01uFS
C4047	SM661207103	SM.01uFS
C4048	SM661207103	SM.01uFS
C4049	SM661255100	SM10pFS
C4050	SM661207103	SM.01uFS
C4051	SM661207103	SM.01uFS
C4052	SM661207103	SM.01uFS
C4053	SM661207103	SM.01uFS
C4054	SM661207103	SM.01uFS
C4055	SM661207103	SM.01uFS
C4056	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C4057	SM661207104	SM.1uFS
C4058	SM661207103	SM.01uFS
C4059	SM661207103	SM.01uFS
C4060	SM661207104	SM.1uFS
C4061	SM661207103	SM.01uFS
C4062	SM661207103	SM.01uFS
C4063	SM661207104	SM.1uFS
C4065	SM666327225	SM2.2uF-20V
C4066	SM661207103	SM.01uFS
C4067	SM661207103	SM.01uFS
C4068	SM666327225	SM2.2uF-20V
C4069	SM666327225	SM2.2uF-20V
C4070	SM666327225	SM2.2uF-20V
C4071	SM666327225	SM2.2uF-20V
C4072	SM661207103	SM.01uFS
C4073	SM661207103	SM.01uFS
C4074	SM661207103	SM.01uFS
C4075	SM661207104	SM.1uFS
C4076	SM661207103	SM.01uFS
C4077	SM661207103	SM.01uFS
C4079	SM661207104	SM.1uFS
C4086	SM666327225	SM2.2uF-20V
C4087	SM661255101	SM100pFS
C4089	SM661207102	SM.001uFS
C4090	SM661207103	SM.01uFS
C4092	SM661207103	SM.01uFS
C4095	SM661207103	SM.01uFS
C4096	SM661207103	SM.01uFS
C4098	SM661256120	SM12pFS
C4099	SM661255470	SM47pFS
C4500	SM661207103	SM.01uFS
C4501	SM661207103	SM.01uFS
C4502	SM661207103	SM.01uFS
C4504	SM661286103	SM.01uF
C4505	SM661255102	SM1000pFS
C4506	SM661207103	SM.01uFS
C4507	SM661286103	SM.01uF
C4508	SM661255102	SM1000pFS
C4509	SM661255102	SM1000pFS
C4510	SM661286103	SM.01uF
C4511	SM661207103	SM.01uFS
C4512	SM661286103	SM.01uF
C4513	SM661207104	SM.1uFS
C4515	SM661207104	SM.1uFS
C4516	SM661207104	SM.1uFS
C4517	SM661207104	SM.1uFS
C4518	SM661207104	SM.1uFS
C4519	SM661207104	SM.1uFS
C4520	SM661207104	SM.1uFS
C4521	SM661207104	SM.1uFS
C4522	SM661207103	SM.01uFS
C4523	SM661207103	SM.01uFS
C4524	SM661207103	SM.01uFS
C4526	SM661207103	SM.01uFS
C4527	SM661207103	SM.01uFS
C4528	SM661207103	SM.01uFS
C4529	SM661207103	SM.01uFS
C4530	SM661207103	SM.01uFS
C4531	SM661207103	SM.01uFS
C4533	SM661207103	SM.01uFS
C4534	SM661207104	SM.1uFS
C4535	SM661207103	SM.01uFS
C4536	SM661207104	SM.1uFS
C4537	SM661207104	SM.1uFS
C4538	SM661207103	SM.01uFS
C4539	SM661207104	SM.1uFS
C4540	SM661207104	SM.1uFS
C4541	SM661207104	SM.1uFS
C4542	SM661207104	SM.1uFS
C4543	SM661207104	SM.1uFS
C4544	SM666237476	SM47uF-6V
C4545	SM666267227	SM220uF-10V
C4546	SM666237476	SM47uF-6V
C4547	SM661207104	SM.1uFS
C4548	SM661207104	SM.1uFS
C4549	SM661207104	SM.1uFS
C4550	SM661207104	SM.1uFS
C4551	SM661207104	SM.1uFS
C4552	SM661207104	SM.1uFS
C4553	SM661207104	SM.1uFS
C4554	SM661207104	SM.1uFS
C4555	SM661207104	SM.1uFS
C4556	SM661207104	SM.1uFS
C4557	SM661207104	SM.1uFS
C4558	SM661207103	SM.01uFS
C4559	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C4600	SM661255039	SM3.9pFS
C4601	158849009	0.5-2.5pF
C4602	SM661207103	SM.01uFS
C4603	SM661207103	SM.01uFS
C4604	SM661207103	SM.01uFS
C4606	SM661207103	SM.01uFS
C4610	SM661255102	SM1000pFS
C4611	SM661207103	SM.01uFS
C5000	SM661207104	SM.1uFS
C5001	SM661207104	SM.1uFS
C5002	SM661255010	SM1pFS
C5003	SM661207103	SM.01uFS
C5004	SM661207103	SM.01uFS
C5005	SM661540033	SM3.3pFS_500V
C5006	SM661207103	SM.01uFS
C5007	SM661207103	SM.01uFS
C5008	SM661207103	SM.01uFS
C5009	SM661207103	SM.01uFS
C5010	SM661540033	SM3.3pFS_500V
C5011	SM661207103	SM.01uFS
C5012	SM661526561	SM560pF_500V
C5013	SM661207103	SM.01uFS
C5014	SM661207104	SM.1uFS
C5015	SM661207103	SM.01uFS
C5016	SM661207103	SM.01uFS
C5017	SM661207103	SM.01uFS
C5018	SM661255821	SM820pFS
C5019	SM666327225	SM2.2uF-20V
C5020	SM661207104	SM.1uFS
C5021	SM661207103	SM.01uFS
C5022	SM661207103	SM.01uFS
C5023	SM661207103	SM.01uFS
C5024	SM661207103	SM.01uFS
C5025	SM661207103	SM.01uFS
C5026	SM661207103	SM.01uFS
C5027	SM661255220	SM22pFS
C5028	SM661255330	SM33pFS
C5029	SM661207103	SM.01uFS
C5030	SM661207103	SM.01uFS
C5031	SM661545150	SM15pFS_500V
C5032	SM661255270	SM27pFS
C5033	SM661255270	SM27pFS
C5034	SM661207103	SM.01uFS
C5035	SM666427105	SM1uF-16V
C5038	SM666427105	SM1uF-16V
C5039	SM661207103	SM.01uFS
C5040	SM661207103	SM.01uFS
C5041	SM661207103	SM.01uFS
C5042	SM661207103	SM.01uFS
C5043	SM661207103	SM.01uFS
C5044	SM661207103	SM.01uFS
C5045	SM661207103	SM.01uFS
C5046	SM661207103	SM.01uFS
C5047	SM661207103	SM.01uFS
C5048	SM661207103	SM.01uFS
C5049	SM661205822	SM.0082uFS
C5050	SM661205822	SM.0082uFS
C5051	SM661255270	SM27pFS
C5052	SM661207103	SM.01uFS
C5053	SM661207103	SM.01uFS
C5054	SM661255270	SM27pFS
C5055	SM661207103	SM.01uFS
C5056	SM661207103	SM.01uFS
C5057	SM666427105	SM1uF-16V
C5058	SM666427105	SM1uF-16V
C5059	SM661207103	SM.01uFS
C5060	SM661207103	SM.01uFS
C5061	SM661207103	SM.01uFS
C5062	SM661207103	SM.01uFS
C5063	SM661207103	SM.01uFS
C5064	SM661207103	SM.01uFS
C5065	SM661207103	SM.01uFS
C5066	SM661207103	SM.01uFS
C5067	SM661207103	SM.01uFS
C5068	SM661205822	SM.0082uFS
C5069	SM661207103	SM.01uFS
C5070	SM661205822	SM.0082uFS
C5071	SM661207103	SM.01uFS
C5072	SM661207103	SM.01uFS
C5073	SM661207103	SM.01uFS
C5074	SM666327225	SM2.2uF-20V
C5075	SM666327225	SM2.2uF-20V
C5076	SM661255270	SM27pFS
C5077	SM661207103	SM.01uFS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
C5078	SM661255101	SM100pFS
C5079	SM666427105	SM1uF-16V
C5083	SM661207104	SM.1uFS
C5084	SM661207103	SM.01uFS
C5085	SM661207103	SM.01uFS
C5086	SM661207103	SM.01uFS
C5087	SM661207103	SM.01uFS
C5088	SM661207103	SM.01uFS
C5089	SM661207103	SM.01uFS
C5090	SM661207103	SM.01uFS
C5091	SM661207103	SM.01uFS
C5092	SM666327225	SM2.2uF-20V
C5093	SM661205822	SM.0082uFS
C5094	SM661207103	SM.01uFS
C5095	SM666327225	SM2.2uF-20V
C5096	SM661207103	SM.01uFS
C5097	SM661207103	SM.01uFS
C5098	SM661207103	SM.01uFS
C5100	SM661207103	SM.01uFS
C5101	SM661207103	SM.01uFS
C5103	SM661207104	SM.1uFS
C5104	SM661207104	SM.1uFS
C5106	SM661207103	SM.01uFS
C5107	SM661255100	SM10pFS
C5108	SM661207103	SM.01uFS
C5110	SM666377226	SM22uF-15V
C5111	SM666377226	SM22uF-15V
C5112	SM661207103	SM.01uFS
C5113	SM661207103	SM.01uFS
C5114	SM661207103	SM.01uFS
C5115	SM661207103	SM.01uFS
C5120	SM661255470	SM47pFS
C5121	SM661255470	SM47pFS
C6000	146654107	100uF-35VALRA
C6001	146654107	100uF-35VALRA
C6003	SM666327225	SM2.2uF-20V
C6004	SM661207103	SM.01uFS
C6005	SM661207103	SM.01uFS
C6006	SM666327225	SM2.2uF-20V
C6007	SM661207103	SM.01uFS
C6008	SM661255102	SM1000pFS
C6009	SM661255056	SM5.6pFS
C7000	SM661207103	SM.01uFS
C7001	SM661207103	SM.01uFS
C7002	SM661207103	SM.01uFS
C7003	SM661207103	SM.01uFS
C7004	SM661207103	SM.01uFS
C7005	SM661207103	SM.01uFS
C7006	SM661207103	SM.01uFS
C7007	SM661207103	SM.01uFS
C7008	SM661207103	SM.01uFS
C7009	SM661255102	SM1000pFS
C7013	SM661207103	SM.01uFS
CR1	SM236030099	BAV99
CR2	SM232120070	BAV70
CR30	SM236030099	BAV99
CR31	SM236030099	BAV99
CR32	SM236030099	BAV99
CR33	SM236030099	BAV99
CR34	SM236030099	BAV99
CR35	SM236030099	BAV99
CR36	SM236030099	BAV99
CR37	SM236030099	BAV99
CR38	SM236030099	BAV99
CR39	SM236030099	BAV99
CR40	SM236030099	BAV99
CR41	SM236030099	BAV99
CR42	SM236030099	BAV99
CR100	SM253032823	HSMS2823
CR200	SM240218451	BZX84-C5V1
CR201	SM240218475	BZX84-C7V5
CR202	SM240218475	BZX84-C7V5
CR207	SM208591336	SMLM336-5
CR400	SM236654004	SM4004
CR401	SM236654004	SM4004
CR700	SM240218451	BZX84-C5V1
CR701	SM236030099	BAV99
CR702	SM240218451	BZX84-C5V1
CR703	SM240218451	BZX84-C5V1
CR704	SM240218451	BZX84-C5V1
CR705	235010005	1N4005
CR707	SM252080682	BA682
CR708	SM252080682	BA682
CR710	SM252080682	BA682
CR713	SM236030099	BAV99
CR716	SM236030099	BAV99

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
CR717	SM252080682	BA682
CR718	SM252080682	BA682
CR719	SM240218451	BZX84-C5V1
CR720	SM240218451	BZX84-C5V1
CR721	SM240218451	BZX84-C5V1
CR722	SM240218451	BZX84-C5V1
CR723	SM232022822	HSMS2822
CR724	SM236030099	BAV99
CR730	SM236030099	BAV99
CR731	SM236030099	BAV99
CR732	SM236030099	BAV99
CR733	SM236030099	BAV99
CR1000	SM229020150	SMTVSS-5V6
CR1001	SM236030099	BAV99
CR1003	SM236030099	BAV99
CR1004	NOBZX	NOBZX
CR1005	SM252023018	BAT18
CR1006	SM236030099	BAV99
CR1007	SM236030099	BAV99
CR1010	SM240218462	BZX84-C6V2
CR1011	NOBZX84	NOBZX84
CR1500	SM236030099	BAV99
CR1501	SM236030099	BAV99
CR1502	SM236030099	BAV99
CR1503	SM236030099	BAV99
CR1504	SM236030099	BAV99
CR1505	SM236030099	BAV99
CR1506	SM236030099	BAV99
CR1507	SM236030099	BAV99
CR1550	SM236030099	BAV99
CR1551	SM240218451	BZX84-C5V1
CR1552	SM240218451	BZX84-C5V1
CR1553	SM240218451	BZX84-C5V1
CR1554	SM240218451	BZX84-C5V1
CR1555	SM240218451	BZX84-C5V1
CR2000	SM229020150	SMTVSS-5V6
CR2001	SM236030099	BAV99
CR2003	SM236030099	BAV99
CR2004	NOBZX	NOBZX
CR2005	SM252023018	BAT18
CR2006	SM236030099	BAV99
CR2007	SM236030099	BAV99
CR2010	SM240218462	BZX84-C6V2
CR2011	NOBZX84	NOBZX84
CR2500	SM236030099	BAV99
CR2501	SM236030099	BAV99
CR2502	SM236030099	BAV99
CR2503	SM236030099	BAV99
CR2504	SM236030099	BAV99
CR2505	SM236030099	BAV99
CR2506	SM236030099	BAV99
CR2507	SM236030099	BAV99
CR2550	SM253032823	HSMS2823
CR2551	SM253032823	HSMS2823
CR2552	SM253032823	HSMS2823
CR2553	SM253032823	HSMS2823
CR2554	SM253032823	HSMS2823
CR2555	SM253032823	HSMS2823
CR2556	SM253032823	HSMS2823
CR2557	SM253032823	HSMS2823
CR2558	SM253032823	HSMS2823
CR3000	SM229020150	SMTVSS-5V6
CR3001	SM236030099	BAV99
CR3003	SM236030099	BAV99
CR3004	NOBZX	NOBZX
CR3005	SM252023018	BAT18
CR3006	SM236030099	BAV99
CR3007	SM236030099	BAV99
CR3010	SM240218462	BZX84-C6V2
CR3011	NOBZX84	NOBZX84
CR3500	SM236030099	BAV99
CR3501	SM236030099	BAV99
CR3502	SM236030099	BAV99
CR3503	SM236030099	BAV99
CR3504	SM236030099	BAV99
CR3505	SM236030099	BAV99
CR3506	SM236030099	BAV99
CR3507	SM236030099	BAV99
CR3550	SM236030099	BAV99
CR3551	SM240218451	BZX84-C5V1
CR3552	SM240218451	BZX84-C5V1
CR3553	SM240218451	BZX84-C5V1
CR3554	SM240218451	BZX84-C5V1
CR3556	SM240218451	BZX84-C5V1

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description	Location	Part Number	Description
CR4000	SM229020150	SMTVSS-5V6	J3	454390002	1x2-ST-M-PL
CR4001	SM236030099	BAV99	J4	454117003	1x3-ST-M-PL
CR4003	SM236030099	BAV99	J710	SM454120025	SM1x12-13-ST-
CR4004	NOBZX	NOBZX	J1000	7093XXP01	BNC-93XX-
CR4005	SM252023018	BAT18	J1500	454111024	4x6-ST-F-PF-
CR4006	SM236030099	BAV99	J1501	454111024	4x48-ST-F-PF-
CR4007	SM236030099	BAV99	J2000	7093XXP01	BNC-93XX
CR4010	SM240218462	BZX84-C6V2	J3000	7093XXP01	BNC-93XX-
CR4011	NOBZX84	NOBZX84	J3500	454111024	4x6-ST-F-PF-
CR4500	SM236030099	BAV99	J3501	454111024	4x48-ST-F-PF-
CR4501	SM236030099	BAV99	J4000	7093XXP01	BNC-93XX-
CR4502	SM236030099	BAV99	J6000	7093XXP01	BNC-93XX-
CR4503	SM236030099	BAV99	J6002	7093XXP01	BNC-93XX-
CR4504	SM236030099	BAV99	J100A	593910001	RG178B_U
CR4505	SM236030099	BAV99	J100B	593910001	RG178B_U
CR4506	SM236030099	BAV99	J10A	593910001	RG178B_U
CR4507	SM236030099	BAV99	J10B	593910001	RG178B_U
CR5000	SM229020150	SMTVSS-5V6	J200A	593910001	RG178B_U
CR5001	SM252023018	BAT18	J200B	593910001	RG178B_U
CR5002	SM232120070	BAV70	J2010A	593910001	RG178B_U
CR5003	SM236030099	BAV99	J2010B	593910001	RG178B_U
CR5004	SM240050033	TZMC3V3	J20A	593910001	RG178B_U
CR5005	SM240050033	TZMC3V3	J20B	593910001	RG178B_U
CR5006	SM240050033	TZMC3V3	J300A	593910001	RG178B_U
CR5007	SM240050033	TZMC3V3	J300B	593910001	RG178B_U
CR5008	NODIODE	NODIODE	J3010A	593910001	RG178B_U
CR5009	SM240050033	TZMC3V3	J3010B	593910001	RG178B_U
CR5010	SM232120070	BAV70	J40A	593910001	RG178B_U
CR5011	SM236030099	BAV99	J40B	593910001	RG178B_U
CR5012	SM236030099	BAV99	J50A	593910001	RG178B_U
CR6000	SM229020150	SMTVSS-5V6	J50B	593910001	RG178B_U
CR6001	SM253032823	HSMS2823	L201	SM301502001	SMBEAD1206
CR6002	SM232022822	HSMS2822	L202	SM301502001	SMBEAD1206
CR6003	SM240050051	TZMC5V1	L203	SM301502001	SMBEAD1206
CR6004	SM236030099	BAV99	L204	SM301502001	SMBEAD1206
DL30	290120005	5nS	L205	SM301502001	SMBEAD1206
DL700	290199015	DL-1L6-15	L206	SM301502001	SMBEAD1206
DL701	290199015	DL-1L6-15	L207	SM301502001	SMBEAD1206
DL705	290120009	9nS	L208	SM301502001	SMBEAD1206
DL712	NO-DELAY	NO-DELAY-5nS	L209	SM301502001	SMBEAD1206
DL770	290199020	DL-1L6-20	L700	SM300446150	SM.015uH
J1	454220096	3x32-ST-F-PF	L1000	SM301502001	SMBEAD1206
J2	454112024	2x12-ST	L1001	SM301502001	SMBEAD1206

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
L1002	SM301502001	SMBEAD1206
L1003	SM301502001	SMBEAD1206
L1004	SM301502001	SMBEAD1206
L1010	SM669080181	SMBEAD0805
L1011	SM669080181	SMBEAD0805
L1020	SM669080181	SMBEAD0805
L1021	SM669080181	SMBEAD0805
L1022	SM669080181	SMBEAD0805
L1023	SM669080181	SMBEAD0805
L1024	SM669080181	SMBEAD0805
L1025	SM669080181	SMBEAD0805
L1026	SM669080181	SMBEAD0805
L1500	SM301502001	SMBEAD1206
L2000	SM301502001	SMBEAD1206
L2001	SM301502001	SMBEAD1206
L2002	SM301502001	SMBEAD1206
L2003	SM301502001	SMBEAD1206
L2004	SM301502001	SMBEAD1206
L2010	SM669080181	SMBEAD0805
L2011	SM669080181	SMBEAD0805
L2020	SM669080181	SMBEAD0805
L2021	SM669080181	SMBEAD0805
L2022	SM669080181	SMBEAD0805
L2023	SM669080181	SMBEAD0805
L2024	SM669080181	SMBEAD0805
L2025	SM669080181	SMBEAD0805
L2026	SM669080181	SMBEAD0805
L3000	SM301502001	SMBEAD1206
L3001	SM301502001	SMBEAD1206
L3002	SM301502001	SMBEAD1206
L3003	SM301502001	SMBEAD1206
L3004	SM301502001	SMBEAD1206
L3010	SM669080181	SMBEAD0805
L3011	SM669080181	SMBEAD0805
L3020	SM669080181	SMBEAD0805
L3021	SM669080181	SMBEAD0805
L3022	SM669080181	SMBEAD0805
L3023	SM669080181	SMBEAD0805
L3024	SM669080181	SMBEAD0805
L3025	SM669080181	SMBEAD0805
L3026	SM669080181	SMBEAD0805
L4000	SM301502001	SMBEAD1206
L4001	SM301502001	SMBEAD1206
L4002	SM301502001	SMBEAD1206
L4003	SM301502001	SMBEAD1206
L4004	SM301502001	SMBEAD1206
L4010	SM669080181	SMBEAD0805
L4011	SM669080181	SMBEAD0805
L4020	SM669080181	SMBEAD0805
L4021	SM669080181	SMBEAD0805
L4022	SM669080181	SMBEAD0805
L4023	SM669080181	SMBEAD0805
L4024	SM669080181	SMBEAD0805
L4025	SM669080181	SMBEAD0805
L4026	SM669080181	SMBEAD0805
L5000	SM301502001	SMBEAD1206
L5001	SM301502001	SMBEAD1206
L5002	SM301502001	SMBEAD1206
L5003	SM301502001	SMBEAD1206
L6000	SM301502001	SMBEAD1206
L6001	SM301502001	SMBEAD1206
Q205	SM280171005	MTD10N05E
Q206	SM280171005	MTD10N05E
Q207	SM280171005	MTD10N05E
Q700	SM275030092	BFT92
Q701	SM270030020	BFS20
Q702	SM207130025	BFT25A
Q703	SM275330858	BC858C
Q704	SM275330858	BC858C
Q705	SM275030092	BFT92
Q706	SM275030092	BFT92
Q707	SM275030092	BFT92
Q710	SM270130092	BFR92A
Q711	SM270130092	BFR92A
Q1000	SM270160520	BFG520X
Q1001	SM280120416	MMBF4416
Q1002	NOBFT93	NOBFT93
Q1003	SM270160520	BFG520X
Q1004	SM275030550	BF550
Q1005	SM270160520	BFG520X
Q1500	SM280171005	MTD10N05E
Q2000	SM270160520	BFG520X
Q2001	SM280120416	MMBF4416
Q2002	SM275030093	BFT93

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
Q2003	SM270160520	BFG520X
Q2004	SM275030550	BF550
Q2005	SM270160520	BFG520X
Q2500	SM275330858	BC858C
Q2501	SM275330858	BC858C
Q2502	SM275330858	BC858C
Q2503	SM275330858	BC858C
Q3000	SM270160520	BFG520X
Q3001	SM280120416	MMBF4416
Q3002	SM275030093	BFT93
Q3003	SM270160520	BFG520X
Q3004	SM275030550	BF550
Q3005	SM270160520	BFG520X
Q4000	SM270160520	BFG520X
Q4001	SM280120416	MMBF4416
Q4002	NOBFT93	NOBFT93
Q4003	SM270160520	BFG520X
Q4004	SM275030550	BF550
Q4005	SM270160520	BFG520X
Q4500	SM275330858	BC858C
Q4501	SM275330858	BC858C
Q4502	SM275330858	BC858C
Q4503	SM275330858	BC858C
Q5000	SM270130092	BFR92A
Q5001	SM280120416	MMBF4416
Q5002	SM270130093	BFR93A
Q5003	SM270160520	BFG520X
Q6000	SM270130093	BFR93A
Q6001	SM275030550	BF550
Q6002	SM270130092	BFR92A
Q6003	SM270130093	BFR93A
Q6004	SM275030550	BF550
R1	SM653101489	SM10.0KS
R2	SM653101489	SM10.0KS
R3	SM653101489	SM10.0KS
R4	SM653101489	SM10.0KS
R5	SM653101489	SM10.0KS
R6	SM653101489	SM10.0KS
R7	SM653101489	SM10.0KS
R8	169416473	NTC-DISC-47K
R9	SM653101522	SM22.1KS
R10	SM653101489	SM10.0KS
R11	SM653101489	SM10.0KS
R12	SM653101461	SM5.11KS
R13	SM653101393	SM1.00KS
R14	SM653101443	SM3.32KS
R15	SM653101443	SM3.32KS
R16	SM653101393	SM1.00KS
R17	SM653101393	SM1.00KS
R18	SM653101443	SM3.32KS
R19	SM653101443	SM3.32KS
R20	SM653101393	SM1.00KS
R21	SM653101393	SM1.00KS
R22	SM653101393	SM1.00KS
R23	SM653101443	SM3.32KS
R24	SM653101393	SM1.00KS
R25	SM653101393	SM1.00KS
R26	SM653101439	SM3.01KS
R27	SM653101443	SM3.32KS
R28	SM653101393	SM1.00KS
R29	SM653101489	SM10.0KS
R31	SM654101000	SM0S
R32	SM653101393	SM1.00KS
R33	SM653101393	SM1.00KS
R34	SM653101489	SM10.0KS
R35	SM653101393	SM1.00KS
R36	SM653101393	SM1.00KS
R37	SM653101234	SM22.1S
R38	SM653101489	SM10.0KS
R39	SM653101234	SM22.1S
R40	SM653101234	SM22.1S
R41	SM653101234	SM22.1S
R42	SM653101281	SM68.1S
R43	SM653101281	SM68.1S
R44	SM653101281	SM68.1S
R45	SM653101393	SM1.00KS
R46	SM653101489	SM10.0KS
R47	SM653101489	SM10.0KS
R48	SM653101489	SM10.0KS
R49	SM653101489	SM10.0KS
R52	SM652115062	SM6.2-1W
R54	SM653101489	SM10.0KS
R56	SM653101201	SM10.0S
R57	SM653101401	SM1.21KS
R58	SM653101234	SM22.1S
R59	SM654101000	SM0S-B2P

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R60	SM654101000	SM0S-B2P
R61	SM654101000	SM0S-B2P
R130	SM653101289	SM82.5S
R200	SM653101489	SM10.0KS
R201	SM653101401	SM1.21KS
R205	SM653101393	SM1.00KS
R206	SM653101443	SM3.32KS
R207	SM653101673	SM825.0KS
R211	SM653101531	SM27.4KS
R212	SM653101410	SM1.50KS
R213	SM653101465	SM5.62KS
R214	SM653101489	SM10.0KS
R215	SM653101489	SM10.0KS
R216	SM653101489	SM10.0KS
R217	SM653101489	SM10.0KS
R218	SM653101489	SM10.0KS
R219	SM653101489	SM10.0KS
R220	SM653101489	SM10.0KS
R221	SM653101489	SM10.0KS
R222	SM653101489	SM10.0KS
R223	SM653101489	SM10.0KS
R224	SM653101489	SM10.0KS
R225	SM653101489	SM10.0KS
R226	SM653101489	SM10.0KS
R231	SM653101269	SM51.1S
R233	SM653101489	SM10.0KS
R234	SM653101489	SM10.0KS
R247	SM653101269	SM51.1S
R252	SM653101269	SM51.1S
R254	SM653101269	SM51.1S
R260	SM653101393	SM1.00KS
R262	SM653101393	SM1.00KS
R263	SM653101393	SM1.00KS
R264	SM653101393	SM1.00KS
R265	SM653101393	SM1.00KS
R266	SM653101393	SM1.00KS
R267	SM654101000	SM0S
R269	SM653101393	SM1.00KS
R270	SM653101297	SM100.0S
R271	SM653101297	SM100.0S
R272	SM653101297	SM100.0S
R273	SM653101297	SM100.0S
R280	SM653101393	SM1.00KS
R281	SM653101393	SM1.00KS
R500	SM653101489	SM10.0KS
R501	SM653101489	SM10.0KS
R502	SM653101489	SM10.0KS
R503	SM653101489	SM10.0KS
R504	SM653101489	SM10.0KS
R505	SM653101489	SM10.0KS
R506	SM653101489	SM10.0KS
R507	SM653101489	SM10.0KS
R510	SM653101489	SM10.0KS
R511	SM653101489	SM10.0KS
R512	SM653101489	SM10.0KS
R513	SM653101489	SM10.0KS
R521	SM653101354	SM392.0S
R522	SM653101269	SM51.1S
R523	SM653101281	SM68.1S
R530	SM653101489	SM10.0KS
R531	SM653101489	SM10.0KS
R532	SM653101489	SM10.0KS
R533	SM653101489	SM10.0KS
R534	SM653101489	SM10.0KS
R535	SM653101489	SM10.0KS
R536	SM653101489	SM10.0KS
R537	SM653101489	SM10.0KS
R540	SM654101000	SM0S-2P
R541	SM654101000	SM0S-2P
R600	SM653101305	SM121.0S
R601	SM653101322	SM182.0S
R602	SM653101322	SM182.0S
R603	SM653101305	SM121.0S
R604	SM653101339	SM274.0S
R605	SM653101305	SM121.0S
R606	SM653101322	SM182.0S
R607	SM653101397	SM1.10KS
R608	SM653101393	SM1.00KS
R609	SM653101397	SM1.10KS
R610	SM653101393	SM1.00KS
R611	SM653101289	SM82.5S
R612	SM653101281	SM68.1S
R614	SM653101322	SM182.0S
R615	SM653101322	SM182.0S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R616	SM653101305	SM121.0S
R617	SM653101305	SM121.0S
R618	SM653101322	SM182.0S
R619	SM653101305	SM121.0S
R620	SM653101281	SM68.1S
R621	SM653101305	SM121.0S
R622	SM653101322	SM182.0S
R624	SM653101322	SM182.0S
R625	SM653101305	SM121.0S
R626	SM653101305	SM121.0S
R627	SM653101322	SM182.0S
R628	SM653101322	SM182.0S
R629	SM653101305	SM121.0S
R630	SM653101305	SM121.0S
R631	SM653101322	SM182.0S
R632	SM653101305	SM121.0S
R633	SM653101322	SM182.0S
R634	SM653101305	SM121.0S
R635	SM653101322	SM182.0S
R636	SM653101322	SM182.0S
R638	SM653101305	SM121.0S
R640	SM653101351	SM365.0S
R641	SM653101362	SM475.0S
R642	SM653101362	SM475.0S
R643	SM653101326	SM200.0S
R645	SM653101289	SM82.5S
R646	SM653101362	SM475.0S
R650	SM653101305	SM121.0S
R651	SM653101322	SM182.0S
R660	SM653101281	SM68.1S
R661	SM653101362	SM475.0S
R662	SM653101322	SM182.0S
R663	SM653101362	SM475.0S
R664	SM653101362	SM475.0S
R665	SM653101269	SM51.1S
R666	SM653101269	SM51.1S
R667	SM653101269	SM51.1S
R668	SM653101269	SM51.1S
R669	SM653101269	SM51.1S
R670	SM653101269	SM51.1S
R671	SM653101269	SM51.1S
R672	SM653101269	SM51.1S
R673	SM653101397	SM1.10KS
R745	SM653101362	SM475.0S
R746	SM653101362	SM475.0S
R747	SM653101362	SM475.0S
R748	SM653101362	SM475.0S
R749	SM653101322	SM182.0S
R750	SM653101322	SM182.0S
R751	SM653101322	SM182.0S
R752	SM653101322	SM182.0S
R753	SM653101305	SM121.0S
R754	SM653101305	SM121.0S
R755	SM653101322	SM182.0S
R756	SM653101322	SM182.0S
R757	SM653101322	SM182.0S
R758	SM653101322	SM182.0S
R759	SM653101297	SM100.0S
R760	SM653101393	SM1.00KS
R761	SM653101393	SM1.00KS
R762	SM653101326	SM200.0S
R763	SM653101326	SM200.0S
R764	SM653101269	SM51.1S
R765	SM653101354	SM392.0S
R766	SM653101362	SM475.0S
R767	SM653101281	SM68.1S
R768	SM653101322	SM182.0S
R769	SM653101322	SM182.0S
R770	SM653101322	SM182.0S
R771	SM653101322	SM182.0S
R772	SM653101305	SM121.0S
R773	SM653101461	SM5.11KS
R775	SM653101322	SM182.0S
R776	SM653101322	SM182.0S
R777	SM653101362	SM475.0S
R778	SM653101322	SM182.0S
R779	SM653101305	SM121.0S
R781	SM653101322	SM182.0S
R782	SM653101322	SM182.0S
R783	SM653101297	SM100.0S
R784	SM653101234	SM22.1S
R785	SM653101234	SM22.1S
R786	SM653101305	SM121.0S
R787	SM653101305	SM121.0S
R788	SM653101297	SM100.0S
R789	SM653101234	SM22.1S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R790	SM653101322	SM182.0S
R791	SM653101305	SM121.0S
R792	SM653101322	SM182.0S
R793	SM653101322	SM182.0S
R794	SM653101305	SM121.0S
R795	SM653101234	SM22.1S
R797	SM653101305	SM121.0S
R799	SM653101322	SM182.0S
R800	SM653101322	SM182.0S
R801	SM653101322	SM182.0S
R802	SM653101322	SM182.0S
R803	SM653101305	SM121.0S
R804	SM653101322	SM182.0S
R805	SM653101322	SM182.0S
R806	SM653101305	SM121.0S
R807	SM653101322	SM182.0S
R808	SM653101308	SM130.0S
R809	SM653101322	SM182.0S
R812	SM653101362	SM475.0S
R820	SM653101322	SM182.0S
R821	SM653101422	SM2.00KS
R822	SM653101281	SM68.1S
R823	SM653101281	SM68.1S
R824	SM653101322	SM182.0S
R832	SM653101322	SM182.0S
R833	SM653101322	SM182.0S
R834	SM653101385	SM825.0S
R835	SM653101351	SM365.0S
R845	SM653101322	SM182.0S
R847	SM653101393	SM1.00KS
R848	SM653101393	SM1.00KS
R849	SM653101305	SM121.0S
R850	SM653101362	SM475.0S
R851	SM653101393	SM1.00KS
R852	SM653101393	SM1.00KS
R855	SM653101362	SM475.0S
R857	SM653101269	SM51.1S
R858	SM653101489	SM10.0KS
R859	SM653101269	SM51.1S
R864	SM653101362	SM475.0S
R865	SM653101461	SM5.11KS
R866	SM653101465	SM5.62KS
R867	SM653101269	SM51.1S
R869	SM653101322	SM182.0S
R872	SM653101489	SM10.0KS
R873	SM653101269	SM51.1S
R879	SM651104204	SM200K-25PPM
R880	SM653101381	SM750.0S
R881	SM653101410	SM1.50KS
R882	SM653101297	SM100.0S
R883	SM653101297	SM100.0S
R886	SM653101297	SM100.0S
R890	SM653101393	SM1.00KS
R891	SM653101410	SM1.50KS
R892	SM653101308	SM130.0S
R893	SM653101339	SM274.0S
R894	SM653101297	SM100.0S
R897	SM653101393	SM1.00KS
R898	SM651104241	SM240-25PPM
R899	SM651104392	SM3.9K-25PPM
R900	SM653101297	SM100.0S
R901	SM653101381	SM750.0S
R902	SM653101381	SM750.0S
R903	SM653101393	SM1.00KS
R904	SM653101393	SM1.00KS
R905	SM651104183	SM18K-25PPM
R906	SM651104182	SM1.8K-25PPM
R907	SM653101339	SM274.0S
R908	SM185457201	SM200-1T
R909	SM653101322	SM182.0S
R910	SM653101322	SM182.0S
R911	SM653101322	SM182.0S
R912	SM653101322	SM182.0S
R913	SM653101285	SM75.0S
R914	SM653101269	SM51.1S
R915	SM653101339	SM274.0S
R916	SM653101330	SM221.0S
R918	SM653101343	SM301.0S
R919	SM653101354	SM392.0S
R923	SM653101285	SM75.0S
R924	SM653101234	SM22.1S
R925	SM653101234	SM22.1S
R929	SM653101489	SM10.0KS
R935	SM653101322	SM182.0S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R936	SM653101322	SM182.0S
R945	SM653101461	SM5.11KS
R946	SM653101465	SM5.62KS
R947	SM653101322	SM182.0S
R948	SM653101322	SM182.0S
R950	SM653101330	SM221.0S
R951	SM653101330	SM221.0S
R952	SM653101330	SM221.0S
R953	SM653101330	SM221.0S
R954	SM653101330	SM221.0S
R955	SM653101330	SM221.0S
R956	SM653101330	SM221.0S
R957	SM653101330	SM221.0S
R958	SM653101330	SM221.0S
R959	SM653101330	SM221.0S
R960	SM653101362	SM475.0S
R974	SM653101362	SM475.0S
R981	SM653101362	SM475.0S
R982	SM653101362	SM475.0S
R983	SM653101269	SM51.1S
R984	SM653101354	SM392.0S
R987	SM653101322	SM182.0S
R990	SM653101461	SM5.11KS
R991	SM653101465	SM5.62KS
R1000	168909001	900.0K-.1%500V
R1001	SM653101251	SM33.2S
R1002	SM653101343	SM301.0S
R1003	SM652061024	SM2.4-0603
R1004	SM653101251	SM33.2S
R1005	SM653101234	SM22.1S
R1006	SM653101489	SM10.0KS
R1007	SM653101358	SM432.0S
R1008	SM653101489	SM10.0KS
R1009	SM653101401	SM1.21KS
R1010	SM653101273	SM56.2S
R1011	SM652181590	SM113K-50PPM
R1012	SM168651315	SM154-1%
R1013	SM168651315	SM154-1%
R1015	SM653101347	SM332.0S
R1016	168909001	900.0K-.1%500V
R1017	SM652181590	SM113K-50PPM
R1018	SM653101269	SM51.1S
R1019	SM653101269	SM51.1S
R1020	SM653101269	SM51.1S
R1021	SM653101297	SM100.0S
R1023	SM653101326	SM200.0S
R1024	SM654101000	SM0S
R1025	SM653101638	SM357.0KS
R1026	SM654101000	SM0S
R1027	SM653101418	SM1.82KS
R1028	SM653101639	SM365.0KS
R1029	SM653185107	SM100.0MS
R1031	SM653101639	SM365.0KS
R1032	SM653101638	SM357.0KS
R1034	SM653101393	SM1.00KS
R1036	SM653101642	SM392.0KS
R1037	SM653101642	SM392.0KS
R1038	SM185457503	SM50K-1T
R1040	SM653101458	SM4.75KS
R1042	SM653101681	SM1.00MS
R1043	SM653101681	SM1.00MS
R1046	SM653101343	SM301.0S
R1047	SM653101393	SM1.00KS
R1048	SM653101489	SM10.0KS
R1049	SM653101557	SM51.1KS
R1050	SM653101347	SM332.0S
R1051	SM652061820	SM82-0603
R1052	SM653101422	SM2.00KS
R1053	SM653101461	SM5.11KS
R1054	SM654101000	SM0S
R1055	SM653101354	SM392.0S
R1056	SM653101269	SM51.1S
R1057	SM653101308	SM130.0S
R1058	SM653101489	SM10.0KS
R1059	SM653101289	SM82.5S
R1060	SM653101489	SM10.0KS
R1061	SM653101443	SM3.32KS
R1062	SM653101269	SM51.1S
R1063	SM653101443	SM3.32KS
R1065	SM653101416	SM1.74KS
R1066	SM185457201	SM200-1T
R1067	SM653101365	SM511.0S
R1068	SM653101443	SM3.32KS
R1069	SM653101373	SM619.0S
R1070	SM653101358	SM432.0S
R1071	SM653101358	SM432.0S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R1072	SM651104392	SM3.9K-25PPM
R1073	SM653101461	SM5.11KS
R1074	SM653101461	SM5.11KS
R1075	SM653101461	SM5.11KS
R1076	SM168651315	SM154-1/oo
R1078	SM653101602	SM150.0KS
R1079	SM653101489	SM10.0KS
R1080	SM653101569	SM68.1KS
R1081	SM653101458	SM4.75KS
R1082	SM653101461	SM5.11KS
R1083	SM653101393	SM1.00KS
R1084	SM653101614	SM200.0KS
R1085	SM653101393	SM1.00KS
R1086	SM653101393	SM1.00KS
R1087	SM653101393	SM1.00KS
R1088	SM653101393	SM1.00KS
R1089	SM653101393	SM1.00KS
R1092	SM653101334	SM243.0S
R1095	SM653101481	SM8.25KS
R1097	SM653101358	SM432.0S
R1099	SM654101000	SM0S-B2P
R1100	SM654101000	SM0S-B2P
R1101	SM654101000	SM0S
R1102	SM654101000	SM0S
R1103	SM653101334	SM243.0S
R1105	SM653101418	SM1.82KS
R1106	SM653101285	SM75.0S
R1150	SM653101347	SM332.0S
R1151	SM185657201	SM200-3313
R1200	SM653101489	SM10.0KS
R1201	SM185657500	SM500-3313
R1202	SM653101269	SM51.1S
R1203	SM185657500	SM500-3313
R1204	SM652061181	SM180-0603
R1500	SM653101269	SM51.1S
R1501	SM653101269	SM51.1S
R1502	SM653101393	SM1.00KS
R1503	SM653101393	SM1.00KS
R1504	SM653101393	SM1.00KS
R1505	SM653101393	SM1.00KS
R1506	SM653101297	SM100.0S
R1507	SM653101489	SM10.0KS
R1508	SM653101297	SM100.0S
R1509	SM653101489	SM10.0KS
R1510	SM653101489	SM10.0KS
R1511	SM653101297	SM100.0S
R1512	SM653101489	SM10.0KS
R1513	SM653101297	SM100.0S
R1514	SM654101000	SM0S
R1515	SM653101393	SM1.00KS
R1516	SM653101393	SM1.00KS
R1517	SM653101393	SM1.00KS
R1518	SM653101393	SM1.00KS
R1519	SM653101489	SM10.0KS
R1520	SM653101393	SM1.00KS
R1529	SM653101393	SM1.00KS
R1530	SM653101393	SM1.00KS
R1531	SM653101393	SM1.00KS
R1532	SM653101393	SM1.00KS
R1533	SM653101393	SM1.00KS
R1534	SM653101285	SM75.0S
R1535	SM653101285	SM75.0S
R1536	SM653101326	SM200.0S
R1537	SM653101281	SM68.1S
R1538	SM653101281	SM68.1S
R1539	SM653101326	SM200.0S
R1540	SM653101281	SM68.1S
R1542	SM653101326	SM200.0S
R1543	SM653101281	SM68.1S
R1544	SM653101326	SM200.0S
R1549	SM653101305	SM121.0S
R1550	SM653101322	SM182.0S
R1551	SM653101305	SM121.0S
R1553	SM653101322	SM182.0S
R1554	SM653101305	SM121.0S
R1555	SM653101322	SM182.0S
R1556	SM653101322	SM182.0S
R1558	SM653101322	SM182.0S
R1559	SM653101305	SM121.0S
R1561	SM653101322	SM182.0S
R1563	SM653101305	SM121.0S
R1564	SM653101322	SM182.0S
R1565	SM653101305	SM121.0S
R1566	SM653101305	SM121.0S

PART: F9384-31 **DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD**

Location	Part Number	Description
R1567	SM653101305	SM121.0S
R1568	SM653101322	SM182.0S
R1569	SM653101326	SM200.0S
R1570	SM653101326	SM200.0S
R1571	SM653101326	SM200.0S
R1572	SM653101326	SM200.0S
R1573	SM653101281	SM68.1S
R1574	SM653101281	SM68.1S
R1575	SM653101281	SM68.1S
R1576	SM653101281	SM68.1S
R1577	SM653101314	SM150.0S
R1578	SM653101314	SM150.0S
R1579	SM653101314	SM150.0S
R1580	SM653101314	SM150.0S
R1581	SM653101281	SM68.1S
R1582	SM653101281	SM68.1S
R1583	SM653101281	SM68.1S
R1584	SM653101281	SM68.1S
R1585	SM653101269	SM51.1S
R1586	SM653101269	SM51.1S
R1589	SM653101322	SM182.0S
R1590	SM653101322	SM182.0S
R1591	SM653101269	SM51.1S
R1592	SM653101269	SM51.1S
R1593	SM653101322	SM182.0S
R1594	SM653101322	SM182.0S
R1599	SM653101322	SM182.0S
R1600	SM653101305	SM121.0S
R1601	SM653101322	SM182.0S
R1602	SM653101305	SM121.0S
R1610	SM185457501	SM500-1T
R1611	SM185457501	SM500-1T
R1700	SM653101305	SM121.0S
R1701	SM653101305	SM121.0S
R1702	SM653101322	SM182.0S
R1703	SM653101322	SM182.0S
R1704	SM653101281	SM68.1S
R1705	SM653101281	SM68.1S
R1800	SM653101308	SM130.0S
R1801	SM653101322	SM182.0S
R1802	SM653101322	SM182.0S
R1803	SM653101273	SM56.2S
R1804	SM653101273	SM56.2S
R1805	SM653101273	SM56.2S
R1806	SM653101273	SM56.2S
R1807	SM653101308	SM130.0S
R1808	SM653101308	SM130.0S
R1810	SM653101281	SM68.1S
R1811	SM653101281	SM68.1S
R1820	SM653101308	SM130.0S
R1821	SM653101314	SM150.0S
R1822	SM653101314	SM150.0S
R1823	SM653101281	SM68.1S
R1824	SM653101281	SM68.1S
R1825	SM653101314	SM150.0S
R1826	SM653101314	SM150.0S
R1827	SM653101308	SM130.0S
R2000	168909001	900.0K-.1%500V
R2001	SM653101251	SM33.2S
R2002	SM653101343	SM301.0S
R2003	SM652061024	SM2.4-0603
R2004	SM653101251	SM33.2S
R2005	SM653101234	SM22.1S
R2006	SM653101489	SM10.0KS
R2007	SM653101358	SM432.0S
R2008	SM653101489	SM10.0KS
R2009	SM653101401	SM1.21KS
R2010	SM653101273	SM56.2S
R2011	SM652181590	SM113K-50PPM
R2012	SM168651315	SM154-1%
R2013	SM168651315	SM154-1%
R2015	SM653101347	SM332.0S
R2016	168909001	900.0K-.1%500V
R2017	SM652181590	SM113K-50PPM
R2018	SM653101269	SM51.1S
R2019	SM653101269	SM51.1S
R2020	SM653101269	SM51.1S
R2021	SM653101297	SM100.0S
R2023	SM653101326	SM200.0S
R2024	SM654101000	SM0S
R2025	SM653101638	SM357.0KS
R2026	SM654101000	SM0S
R2027	SM653101418	SM1.82KS
R2028	SM653101639	SM365.0KS
R2029	SM653185107	SM100.0MS
R2031	SM653101639	SM365.0KS

PART: F9384-31 **DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD**

Location	Part Number	Description
R2032	SM653101638	SM357.0KS
R2034	SM653101393	SM1.00KS
R2035	SM653101281	SM68.1S
R2036	SM653101642	SM392.0KS
R2037	SM653101642	SM392.0KS
R2038	SM185457503	SM50K-1T
R2039	SM653101251	SM33.2S
R2040	SM653101458	SM4.75KS
R2042	SM653101681	SM1.00MS
R2043	SM653101681	SM1.00MS
R2044	SM653101201	SM10.0S
R2046	SM653101343	SM301.0S
R2047	SM653101393	SM1.00KS
R2048	SM653101489	SM10.0KS
R2049	SM653101557	SM51.1KS
R2050	SM653101347	SM332.0S
R2051	SM652061820	SM82-0603
R2052	SM653101422	SM2.00KS
R2053	SM653101461	SM5.11KS
R2054	SM654101000	SM0S
R2055	SM653101354	SM392.0S
R2056	SM653101269	SM51.1S
R2057	SM653101308	SM130.0S
R2058	SM653101489	SM10.0KS
R2059	SM653101289	SM82.5S
R2060	SM653101489	SM10.0KS
R2061	SM653101443	SM3.32KS
R2062	SM653101269	SM51.1S
R2063	SM653101443	SM3.32KS
R2065	SM653101416	SM1.74KS
R2066	SM185457201	SM200-1T
R2067	SM653101365	SM511.0S
R2068	SM653101443	SM3.32KS
R2069	SM653101373	SM619.0S
R2070	SM653101358	SM432.0S
R2071	SM653101358	SM432.0S
R2072	SM651104392	SM3.9K-25PPM
R2073	SM653101461	SM5.11KS
R2074	SM653101461	SM5.11KS
R2075	SM653101461	SM5.11KS
R2076	SM168651315	SM154-1/oo
R2078	SM653101602	SM150.0KS
R2079	SM653101489	SM10.0KS
R2080	SM653101569	SM68.1KS
R2081	SM653101458	SM4.75KS
R2082	SM653101461	SM5.11KS
R2083	SM653101393	SM1.00KS
R2084	SM653101614	SM200.0KS
R2085	SM653101393	SM1.00KS
R2086	SM653101393	SM1.00KS
R2087	SM653101393	SM1.00KS
R2088	SM653101393	SM1.00KS
R2089	SM653101393	SM1.00KS
R2092	SM653101334	SM243.0S
R2095	SM653101481	SM8.25KS
R2097	SM653101358	SM432.0S
R2099	SM654101000	SM0S-B2P
R2100	SM654101000	SM0S-B2P
R2101	SM654101000	SM0S
R2102	SM654101000	SM0S
R2103	SM653101334	SM243.0S
R2105	SM653101418	SM1.82KS
R2106	SM653101285	SM75.0S
R2150	SM653101347	SM332.0S
R2151	SM185657201	SM200-3313
R2200	SM653101489	SM10.0KS
R2201	SM185657500	SM500-3313
R2202	SM653101269	SM51.1S
R2203	SM185657500	SM500-3313
R2204	SM652061181	SM180-0603
R2500	SM653101269	SM51.1S
R2501	SM653101269	SM51.1S
R2502	SM653101489	SM10.0KS
R2503	SM653101251	SM33.2S
R2504	SM653101251	SM33.2S
R2505	SM653101489	SM10.0KS
R2506	SM653101489	SM10.0KS
R2507	SM653101489	SM10.0KS
R2508	SM653101489	SM10.0KS
R2509	SM653101489	SM10.0KS
R2510	SM653101489	SM10.0KS
R2511	SM653101489	SM10.0KS
R2512	SM653101251	SM33.2S
R2513	SM653101251	SM33.2S

PART: F9384-31 **DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD**

Location	Part Number	Description
R2514	SM653101489	SM10.0KS
R2515	SM653101489	SM10.0KS
R2516	SM653101489	SM10.0KS
R2517	SM653101489	SM10.0KS
R2518	SM653101489	SM10.0KS
R2519	SM653101489	SM10.0KS
R2520	SM653101489	SM10.0KS
R2521	SM653101489	SM10.0KS
R2522	SM653101393	SM1.00KS
R2523	SM653101393	SM1.00KS
R2524	SM653101393	SM1.00KS
R2525	SM653101393	SM1.00KS
R2526	SM653101393	SM1.00KS
R2527	SM653101330	SM221.0S
R2528	SM653101393	SM1.00KS
R2529	SM653101322	SM182.0S
R2530	SM653101373	SM619.0S
R2531	SM653101255	SM36.5S
R2532	SM653101397	SM1.10KS
R2533	SM653101230	SM20.0S
R2534	SM653101269	SM51.1S
R2535	SM653101269	SM51.1S
R2536	SM653101393	SM1.00KS
R2537	SM653101266	SM47.5S
R2538	SM653101266	SM47.5S
R2539	SM653101393	SM1.00KS
R2540	SM653101285	SM75.0S
R2541	SM653101285	SM75.0S
R2542	SM653101326	SM200.0S
R2544	SM653101281	SM68.1S
R2545	SM653101281	SM68.1S
R2546	SM653101281	SM68.1S
R2547	SM653101326	SM200.0S
R2548	SM653101281	SM68.1S
R2549	SM653101326	SM200.0S
R2550	SM653101326	SM200.0S
R2554	SM653101305	SM121.0S
R2555	SM653101322	SM182.0S
R2556	SM653101322	SM182.0S
R2557	SM653101305	SM121.0S
R2558	SM653101305	SM121.0S
R2559	SM653101322	SM182.0S
R2560	SM653101322	SM182.0S
R2562	SM653101305	SM121.0S
R2563	SM653101305	SM121.0S
R2564	SM653101322	SM182.0S
R2565	SM653101305	SM121.0S
R2566	SM653101322	SM182.0S
R2567	SM653101322	SM182.0S
R2568	SM653101305	SM121.0S
R2569	SM653101322	SM182.0S
R2570	SM653101305	SM121.0S
R2571	SM653101326	SM200.0S
R2572	SM653101326	SM200.0S
R2573	SM653101326	SM200.0S
R2574	SM653101326	SM200.0S
R2575	SM653101281	SM68.1S
R2576	SM653101281	SM68.1S
R2577	SM653101281	SM68.1S
R2578	SM653101281	SM68.1S
R2579	SM653101314	SM150.0S
R2580	SM653101314	SM150.0S
R2581	SM653101314	SM150.0S
R2582	SM653101314	SM150.0S
R2583	SM653101281	SM68.1S
R2584	SM653101281	SM68.1S
R2585	SM653101281	SM68.1S
R2586	SM653101281	SM68.1S
R2587	SM653101281	SM68.1S
R2588	SM653101281	SM68.1S
R2589	SM653101354	SM392.0S
R2590	SM653101343	SM301.0S
R2591	SM653101354	SM392.0S
R2592	SM653101354	SM392.0S
R2593	SM653101281	SM68.1S
R2594	SM653101281	SM68.1S
R2595	SM653101354	SM392.0S
R2596	SM653101269	SM51.1S
R2597	SM653101269	SM51.1S
R2598	SM654101000	SM0S-2P
R2600	SM653101322	SM182.0S
R2601	SM653101322	SM182.0S
R2602	SM653101269	SM51.1S
R2603	SM653101269	SM51.1S
R2604	SM653101322	SM182.0S
R2605	SM653101322	SM182.0S

PART: F9384-31 **DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD**

Location	Part Number	Description
R2618	SM653101305	SM121.0S
R2619	SM653101322	SM182.0S
R2620	SM653101322	SM182.0S
R2621	SM653101305	SM121.0S
R2622	SM653101281	SM68.1S
R2623	SM653101281	SM68.1S
R2624	SM653101281	SM68.1S
R2625	SM653101281	SM68.1S
R2630	SM653101281	SM68.1S
R2631	SM653101289	SM82.5S
R2632	SM653101289	SM82.5S
R2633	SM653101281	SM68.1S
R2637	SM653101343	SM301.0S
R2640	SM653101281	SM68.1S
R2641	SM653101281	SM68.1S
R2700	SM653101273	SM56.2S
R2701	SM653101273	SM56.2S
R2702	SM653101308	SM130.0S
R2703	SM653101273	SM56.2S
R2704	SM653101273	SM56.2S
R2705	SM653101308	SM130.0S
R2707	SM653101281	SM68.1S
R2708	SM653101281	SM68.1S
R2710	SM653101308	SM130.0S
R2711	SM653101322	SM182.0S
R2712	SM653101322	SM182.0S
R2713	SM653101314	SM150.0S
R2714	SM653101314	SM150.0S
R2715	SM653101314	SM150.0S
R2716	SM653101314	SM150.0S
R2717	SM653101308	SM130.0S
R2718	SM653101281	SM68.1S
R2719	SM653101281	SM68.1S
R2720	SM653101281	SM68.1S
R2722	SM653101281	SM68.1S
R2723	SM653101308	SM130.0S
R3000	168909001	900.0K-.1%500V
R3001	SM653101251	SM33.2S
R3002	SM653101343	SM301.0S
R3003	SM652061024	SM2.4-0603
R3004	SM653101251	SM33.2S
R3005	SM653101234	SM22.1S
R3006	SM653101489	SM10.0KS
R3007	SM653101358	SM432.0S
R3008	SM653101489	SM10.0KS
R3009	SM653101401	SM1.21KS
R3010	SM653101273	SM56.2S
R3011	SM652181590	SM113K-50PPM
R3012	SM168651315	SM154-1%
R3013	SM168651315	SM154-1%
R3015	SM653101347	SM332.0S
R3016	168909001	900.0K-.1%500V
R3017	SM652181590	SM113K-50PPM
R3018	SM653101269	SM51.1S
R3019	SM653101269	SM51.1S
R3020	SM653101269	SM51.1S
R3021	SM653101297	SM100.0S
R3023	SM653101326	SM200.0S
R3024	SM654101000	SM0S
R3025	SM653101638	SM357.0KS
R3026	SM654101000	SM0S
R3027	SM653101418	SM1.82KS
R3028	SM653101639	SM365.0KS
R3029	SM653185107	SM100.0MS
R3031	SM653101639	SM365.0KS
R3032	SM653101638	SM357.0KS
R3034	SM653101393	SM1.00KS
R3035	SM653101281	SM68.1S
R3036	SM653101642	SM392.0KS
R3037	SM653101642	SM392.0KS
R3038	SM185457503	SM50K-1T
R3039	SM653101251	SM33.2S
R3040	SM653101458	SM4.75KS
R3042	SM653101681	SM1.00MS
R3043	SM653101681	SM1.00MS
R3044	SM653101201	SM10.0S
R3046	SM653101343	SM301.0S
R3047	SM653101393	SM1.00KS
R3048	SM653101489	SM10.0KS
R3049	SM653101557	SM51.1KS
R3050	SM653101347	SM332.0S
R3051	SM652061820	SM82-0603
R3052	SM653101422	SM2.00KS
R3053	SM653101461	SM5.11KS

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R3054	SM654101000	SM0S
R3055	SM653101354	SM392.0S
R3056	SM653101269	SM51.1S
R3057	SM653101308	SM130.0S
R3058	SM653101489	SM10.0KS
R3059	SM653101289	SM82.5S
R3060	SM653101489	SM10.0KS
R3061	SM653101443	SM3.32KS
R3062	SM653101269	SM51.1S
R3063	SM653101443	SM3.32KS
R3065	SM653101416	SM1.74KS
R3066	SM185457201	SM200-1T
R3067	SM653101365	SM511.0S
R3068	SM653101443	SM3.32KS
R3069	SM653101373	SM619.0S
R3070	SM653101358	SM432.0S
R3071	SM653101358	SM432.0S
R3072	SM651104392	SM3.9K-25PPM
R3073	SM653101461	SM5.11KS
R3074	SM653101461	SM5.11KS
R3075	SM653101461	SM5.11KS
R3076	SM168651315	SM154-1/oo
R3078	SM653101602	SM150.0KS
R3079	SM653101489	SM10.0KS
R3080	SM653101569	SM68.1KS
R3081	SM653101458	SM4.75KS
R3082	SM653101461	SM5.11KS
R3083	SM653101393	SM1.00KS
R3084	SM653101614	SM200.0KS
R3085	SM653101393	SM1.00KS
R3086	SM653101393	SM1.00KS
R3087	SM653101393	SM1.00KS
R3088	SM653101393	SM1.00KS
R3089	SM653101393	SM1.00KS
R3092	SM653101334	SM243.0S
R3095	SM653101481	SM8.25KS
R3097	SM653101358	SM432.0S
R3099	SM654101000	SM0S-B2P
R3100	SM654101000	SM0S-B2P
R3101	SM654101000	SM0S
R3102	SM654101000	SM0S
R3103	SM653101334	SM243.0S
R3105	SM653101418	SM1.82KS
R3106	SM653101285	SM75.0S
R3150	SM653101347	SM332.0S
R3151	SM185657201	SM200-3313
R3200	SM653101489	SM10.0KS
R3201	SM185657500	SM500-3313
R3202	SM653101269	SM51.1S
R3203	SM185657500	SM500-3313
R3204	SM652061181	SM180-0603
R3500	SM653101269	SM51.1S
R3501	SM653101269	SM51.1S
R3502	SM653101305	SM121.0S
R3503	SM653101305	SM121.0S
R3505	SM653101322	SM182.0S
R3506	SM653101322	SM182.0S
R3507	SM653101393	SM1.00KS
R3508	SM653101393	SM1.00KS
R3509	SM653101393	SM1.00KS
R3510	SM653101393	SM1.00KS
R3511	SM653101297	SM100.0S
R3512	SM653101489	SM10.0KS
R3513	SM653101297	SM100.0S
R3514	SM653101489	SM10.0KS
R3515	SM653101297	SM100.0S
R3516	SM653101297	SM100.0S
R3517	SM653101397	SM1.10KS
R3518	SM653101230	SM20.0S
R3520	SM653101255	SM36.5S
R3521	SM653101373	SM619.0S
R3522	SM653101393	SM1.00KS
R3523	SM653101393	SM1.00KS
R3524	SM653101393	SM1.00KS
R3525	SM653101393	SM1.00KS
R3526	SM653101269	SM51.1S
R3527	SM653101269	SM51.1S
R3529	SM653101393	SM1.00KS
R3530	SM653101393	SM1.00KS
R3531	SM653101393	SM1.00KS
R3532	SM653101393	SM1.00KS
R3533	SM653101393	SM1.00KS
R3534	SM653101285	SM75.0S
R3535	SM653101285	SM75.0S
R3536	SM653101326	SM200.0S
R3537	SM653101326	SM200.0S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R3538	SM653101281	SM68.1S
R3539	SM653101281	SM68.1S
R3540	SM653101281	SM68.1S
R3541	SM653101326	SM200.0S
R3542	SM653101281	SM68.1S
R3543	SM653101326	SM200.0S
R3548	SM653101305	SM121.0S
R3549	SM653101305	SM121.0S
R3550	SM653101322	SM182.0S
R3551	SM653101305	SM121.0S
R3553	SM653101322	SM182.0S
R3554	SM653101322	SM182.0S
R3555	SM653101305	SM121.0S
R3556	SM653101322	SM182.0S
R3557	SM653101322	SM182.0S
R3558	SM653101305	SM121.0S
R3559	SM653101322	SM182.0S
R3560	SM653101305	SM121.0S
R3561	SM653101305	SM121.0S
R3562	SM653101305	SM121.0S
R3563	SM653101322	SM182.0S
R3564	SM653101322	SM182.0S
R3565	SM653101314	SM150.0S
R3566	SM653101314	SM150.0S
R3567	SM653101314	SM150.0S
R3568	SM653101314	SM150.0S
R3569	SM653101281	SM68.1S
R3570	SM653101281	SM68.1S
R3571	SM653101281	SM68.1S
R3572	SM653101281	SM68.1S
R3573	SM653101326	SM200.0S
R3574	SM653101326	SM200.0S
R3575	SM653101326	SM200.0S
R3576	SM653101326	SM200.0S
R3577	SM653101281	SM68.1S
R3578	SM653101281	SM68.1S
R3579	SM653101281	SM68.1S
R3580	SM653101281	SM68.1S
R3581	SM653101269	SM51.1S
R3582	SM653101269	SM51.1S
R3585	SM653101322	SM182.0S
R3586	SM653101322	SM182.0S
R3587	SM653101269	SM51.1S
R3588	SM653101269	SM51.1S
R3589	SM653101322	SM182.0S
R3590	SM653101322	SM182.0S
R3596	SM653101354	SM392.0S
R3597	SM653101281	SM68.1S
R3598	SM653101281	SM68.1S
R3599	SM653101354	SM392.0S
R3600	SM653101343	SM301.0S
R3601	SM653101354	SM392.0S
R3602	SM653101343	SM301.0S
R3603	SM653101281	SM68.1S
R3604	SM653101281	SM68.1S
R3605	SM653101354	SM392.0S
R3610	SM653101281	SM68.1S
R3611	SM653101281	SM68.1S
R3614	SM653101322	SM182.0S
R3615	SM653101305	SM121.0S
R3616	SM653101322	SM182.0S
R3617	SM653101305	SM121.0S
R3620	SM185457501	SM500-1T
R3621	SM185457501	SM500-1T
R3623	SM653101489	SM10.0KS
R3624	SM653101489	SM10.0KS
R3700	SM653101308	SM130.0S
R3701	SM653101322	SM182.0S
R3702	SM653101322	SM182.0S
R3703	SM653101273	SM56.2S
R3704	SM653101273	SM56.2S
R3705	SM653101308	SM130.0S
R3706	SM653101273	SM56.2S
R3707	SM653101273	SM56.2S
R3708	SM653101308	SM130.0S
R3710	SM653101281	SM68.1S
R3711	SM653101281	SM68.1S
R3712	SM653101308	SM130.0S
R3713	SM653101314	SM150.0S
R3714	SM653101314	SM150.0S
R3715	SM653101314	SM150.0S
R3716	SM653101281	SM68.1S
R3717	SM653101281	SM68.1S
R3718	SM653101314	SM150.0S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R3719	SM653101308	SM130.0S
R4000	168909001	900.0K-.1%500V
R4001	SM653101251	SM33.2S
R4002	SM653101343	SM301.0S
R4003	SM652061024	SM2.4-0603
R4004	SM653101251	SM33.2S
R4005	SM653101234	SM22.1S
R4006	SM653101489	SM10.0KS
R4007	SM653101358	SM432.0S
R4008	SM653101489	SM10.0KS
R4009	SM653101401	SM1.21KS
R4010	SM653101273	SM56.2S
R4011	SM652181590	SM113K-50PPM
R4012	SM168651315	SM154-1%
R4013	SM168651315	SM154-1%
R4015	SM653101347	SM332.0S
R4016	168909001	900.0K-.1%500V
R4017	SM652181590	SM113K-50PPM
R4018	SM653101269	SM51.1S
R4019	SM653101269	SM51.1S
R4020	SM653101269	SM51.1S
R4021	SM653101297	SM100.0S
R4023	SM653101326	SM200.0S
R4024	SM654101000	SM0S
R4025	SM653101638	SM357.0KS
R4026	SM654101000	SM0S
R4027	SM653101418	SM1.82KS
R4028	SM653101639	SM365.0KS
R4029	SM653185107	SM100.0MS
R4031	SM653101639	SM365.0KS
R4032	SM653101638	SM357.0KS
R4034	SM653101393	SM1.00KS
R4036	SM653101642	SM392.0KS
R4037	SM653101642	SM392.0KS
R4038	SM185457503	SM50K-1T
R4040	SM653101458	SM4.75KS
R4042	SM653101681	SM1.00MS
R4043	SM653101681	SM1.00MS
R4046	SM653101343	SM301.0S
R4047	SM653101393	SM1.00KS
R4048	SM653101489	SM10.0KS
R4049	SM653101557	SM51.1KS
R4050	SM653101347	SM332.0S
R4051	SM652061820	SM82-0603
R4052	SM653101422	SM2.00KS
R4053	SM653101461	SM5.11KS
R4054	SM654101000	SM0S
R4055	SM653101354	SM392.0S
R4056	SM653101269	SM51.1S
R4057	SM653101308	SM130.0S
R4058	SM653101489	SM10.0KS
R4059	SM653101289	SM82.5S
R4060	SM653101489	SM10.0KS
R4061	SM653101443	SM3.32KS
R4062	SM653101269	SM51.1S
R4063	SM653101443	SM3.32KS
R4065	SM653101416	SM1.74KS
R4066	SM185457201	SM200-1T
R4067	SM653101365	SM511.0S
R4068	SM653101443	SM3.32KS
R4069	SM653101373	SM619.0S
R4070	SM653101358	SM432.0S
R4071	SM653101358	SM432.0S
R4072	SM651104392	SM3.9K-25PPM
R4073	SM653101461	SM5.11KS
R4074	SM653101461	SM5.11KS
R4075	SM653101461	SM5.11KS
R4076	SM168651315	SM154-1/oo
R4078	SM653101602	SM150.0KS
R4079	SM653101489	SM10.0KS
R4080	SM653101569	SM68.1KS
R4081	SM653101458	SM4.75KS
R4082	SM653101461	SM5.11KS
R4083	SM653101393	SM1.00KS
R4084	SM653101614	SM200.0KS
R4085	SM653101393	SM1.00KS
R4086	SM653101393	SM1.00KS
R4087	SM653101393	SM1.00KS
R4088	SM653101393	SM1.00KS
R4089	SM653101393	SM1.00KS
R4092	SM653101334	SM243.0S
R4095	SM653101481	SM8.25KS
R4097	SM653101358	SM432.0S
R4099	SM654101000	SM0S-B2P
R4100	SM654101000	SM0S-B2P
R4101	SM654101000	SM0S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R4102	SM654101000	SM0S
R4103	SM653101334	SM243.0S
R4105	SM653101418	SM1.82KS
R4106	SM653101285	SM75.0S
R4150	SM653101347	SM332.0S
R4151	SM185657201	SM200-3313
R4200	SM653101489	SM10.0KS
R4201	SM185657500	SM500-3313
R4202	SM653101269	SM51.1S
R4203	SM185657500	SM500-3313
R4204	SM652061181	SM180-0603
R4502	SM653101330	SM221.0S
R4503	SM653101393	SM1.00KS
R4504	SM653101322	SM182.0S
R4505	SM653101393	SM1.00KS
R4507	SM653101251	SM33.2S
R4508	SM653101489	SM10.0KS
R4509	SM653101489	SM10.0KS
R4510	SM653101489	SM10.0KS
R4511	SM653101489	SM10.0KS
R4512	SM653101489	SM10.0KS
R4513	SM653101489	SM10.0KS
R4514	SM653101489	SM10.0KS
R4515	SM653101251	SM33.2S
R4516	SM653101251	SM33.2S
R4517	SM653101489	SM10.0KS
R4518	SM653101285	SM75.0S
R4519	SM653101285	SM75.0S
R4520	SM653101326	SM200.0S
R4521	SM653101326	SM200.0S
R4522	SM653101305	SM121.0S
R4523	SM653101326	SM200.0S
R4524	SM653101326	SM200.0S
R4525	SM653101281	SM68.1S
R4526	SM653101281	SM68.1S
R4527	SM653101281	SM68.1S
R4528	SM653101281	SM68.1S
R4533	SM653101305	SM121.0S
R4534	SM653101322	SM182.0S
R4535	SM653101322	SM182.0S
R4536	SM653101305	SM121.0S
R4537	SM653101305	SM121.0S
R4538	SM653101322	SM182.0S
R4539	SM653101322	SM182.0S
R4540	SM653101322	SM182.0S
R4544	SM653101322	SM182.0S
R4546	SM653101305	SM121.0S
R4547	SM653101322	SM182.0S
R4548	SM653101305	SM121.0S
R4549	SM653101305	SM121.0S
R4550	SM653101305	SM121.0S
R4551	SM653101322	SM182.0S
R4552	SM653101326	SM200.0S
R4553	SM653101326	SM200.0S
R4554	SM653101326	SM200.0S
R4555	SM653101326	SM200.0S
R4556	SM653101281	SM68.1S
R4557	SM653101281	SM68.1S
R4558	SM653101281	SM68.1S
R4559	SM653101281	SM68.1S
R4560	SM653101314	SM150.0S
R4561	SM653101314	SM150.0S
R4562	SM653101314	SM150.0S
R4563	SM653101314	SM150.0S
R4564	SM653101281	SM68.1S
R4565	SM653101281	SM68.1S
R4566	SM653101281	SM68.1S
R4567	SM653101281	SM68.1S
R4568	SM653101322	SM182.0S
R4569	SM653101322	SM182.0S
R4570	SM653101269	SM51.1S
R4571	SM653101269	SM51.1S
R4572	SM653101322	SM182.0S
R4573	SM653101322	SM182.0S
R4576	SM653101269	SM51.1S
R4577	SM653101269	SM51.1S
R4578	SM653101305	SM121.0S
R4579	SM653101322	SM182.0S
R4580	SM653101322	SM182.0S
R4581	SM653101305	SM121.0S
R4583	SM653101251	SM33.2S
R4584	SM654101000	SM0S-2P
R4600	SM653101273	SM56.2S
R4601	SM653101273	SM56.2S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R4602	SM653101308	SM130.0S
R4603	SM653101273	SM56.2S
R4604	SM653101273	SM56.2S
R4605	SM653101308	SM130.0S
R4607	SM653101281	SM68.1S
R4608	SM653101281	SM68.1S
R4610	SM653101322	SM182.0S
R4611	SM653101322	SM182.0S
R4620	SM653101308	SM130.0S
R5000	SM653101251	SM33.2S
R5001	SM653101234	SM22.1S
R5002	SM653101201	SM10.0S
R5003	SM653101251	SM33.2S
R5004	SM653101251	SM33.2S
R5005	SM653101585	SM100.0KS
R5006	168909001	900.0K-.1%500V
R5007	SM653101297	SM100.0S
R5008	SM653101418	SM1.82KS
R5010	168909001	900.0K-.1%500V
R5011	SM653101269	SM51.1S
R5012	SM653101418	SM1.82KS
R5013	SM653101401	SM1.21KS
R5014	SM653101377	SM681.0S
R5015	SM653185107	SM100.0MS
R5016	SM168659006	SM111.1K-1/oo
R5017	SM653101506	SM15.0KS
R5018	SM653101514	SM18.2KS
R5020	SM653101297	SM100.0S
R5021	SM653101354	SM392.0S
R5022	SM653101281	SM68.1S
R5023	SM653101650	SM475.0KS
R5024	SM653101665	SM681.0KS
R5025	SM653101489	SM10.0KS
R5026	SM653101585	SM100.0KS
R5027	SM653101251	SM33.2S
R5028	SM653101285	SM75.0S
R5029	SM652110904	SM900K-5/oo
R5030	SM653101297	SM100.0S
R5031	SM653101365	SM511.0S
R5032	SM653101489	SM10.0KS
R5033	SM653101281	SM68.1S
R5034	SM653101201	SM10.0S
R5035	SM653101362	SM475.0S
R5036	SM653101297	SM100.0S
R5038	SM653101673	SM825.0KS
R5039	SM653101269	SM51.1S
R5040	SM653101418	SM1.82KS
R5041	SM653101269	SM51.1S
R5042	SM653101418	SM1.82KS
R5045	SM653101369	SM562.0S
R5049	SM653101369	SM562.0S
R5051	SM653101461	SM5.11KS
R5052	SM653101509	SM16.2KS
R5053	SM185457203	SM20K-1T
R5054	SM653101509	SM16.2KS
R5055	SM185457203	SM20K-1T
R5056	SM653101443	SM3.32KS
R5057	SM654101000	SM0S
R5060	SM654101000	SM0S
R5061	SM653101443	SM3.32KS
R5062	SM653101443	SM3.32KS
R5064	SM654101000	SM0S
R5066	SM654101000	SM0S
R5067	SM653101443	SM3.32KS
R5068	SM653101461	SM5.11KS
R5071	SM653101269	SM51.1S
R5072	SM653101269	SM51.1S
R5073	SM653101418	SM1.82KS
R5074	SM653101418	SM1.82KS
R5075	SM653101369	SM562.0S
R5076	SM653101369	SM562.0S
R5077	SM653101509	SM16.2KS
R5078	SM185457203	SM20K-1T
R5079	SM653101509	SM16.2KS
R5080	SM185457203	SM20K-1T
R5081	SM653101443	SM3.32KS
R5082	SM654101000	SM0S
R5084	SM654101000	SM0S
R5086	SM653101443	SM3.32KS
R5087	SM653101461	SM5.11KS
R5088	SM653101443	SM3.32KS
R5089	SM654101000	SM0S
R5091	SM654101000	SM0S
R5093	SM653101443	SM3.32KS
R5094	SM653101461	SM5.11KS
R5095	SM653101269	SM51.1S

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

Location	Part Number	Description
R5096	SM653101269	SM51.1S
R5097	SM653101418	SM1.82KS
R5099	SM653101369	SM562.0S
R5100	SM653101326	SM200.0S
R5101	SM653101269	SM51.1S
R5103	SM653101509	SM16.2KS
R5104	SM653101326	SM200.0S
R5106	SM653101322	SM182.0S
R5107	SM653101461	SM5.11KS
R5108	SM185457203	SM20K-1T
R5109	SM653101322	SM182.0S
R5110	SM653101461	SM5.11KS
R5111	SM653101461	SM5.11KS
R5112	SM653101443	SM3.32KS
R5113	SM654101000	SM0S
R5115	SM654101000	SM0S
R5117	SM653101443	SM3.32KS
R5118	SM653101461	SM5.11KS
R5119	SM653101465	SM5.62KS
R5120	SM653101465	SM5.62KS
R5121	SM653101461	SM5.11KS
R5122	SM653101465	SM5.62KS
R5123	SM653101465	SM5.62KS
R5125	SM653101305	SM121.0S
R5126	SM168651297	SM100-1%MM
R5127	SM168651297	SM100-1%MM
R5129	SM185457502	SM5K-1T
R5130	SM653101569	SM68.1KS
R5131	SM653101450	SM3.92KS
R5132	SM653101681	SM1.00MS
R5133	SM653101461	SM5.11KS
R5134	SM653101461	SM5.11KS
R5135	SM653101461	SM5.11KS
R5136	SM653101481	SM8.25KS
R5137	SM653101443	SM3.32KS
R5139	SM653101397	SM1.10KS
R5140	SM653101393	SM1.00KS
R5141	SM653101461	SM5.11KS
R5142	SM653101461	SM5.11KS
R5143	SM653101269	SM51.1S
R5144	SM653101269	SM51.1S
R5145	SM653101269	SM51.1S

Location	Part Number	Description
R5146	SM653101269	SM51.1S
R5147	SM653101269	SM51.1S
R5148	SM653101297	SM100.0S
R5150	SM653101297	SM100.0S
R5160	SM168651315	SM154-1/oo
R5161	SM168651315	SM154-1/oo
R5201	SM653101269	SM51.1S
R6000	SM653101251	SM33.2S
R6001	SM168659007	SM3.0K-1/oo
R6002	SM168659297	SM100-1/oo
R6003	SM168659297	SM100-1/oo
R6004	SM653101347	SM332.0S
R6005	SM653101397	SM1.10KS
R6006	SM653101251	SM33.2S
R6007	SM653101322	SM182.0S
R6008	SM653101397	SM1.10KS
R6009	SM653101373	SM619.0S
R6010	SM653101461	SM5.11KS
R6011	SM653101461	SM5.11KS
R6012	SM653101308	SM130.0S
R6013	SM653101354	SM392.0S
R6014	SM168659007	SM3.0K-1/oo
R6015	SM168659007	SM3.0K-1/oo
R6016	SM168659004	SM900-1/oo
R6017	SM168659297	SM100-1/oo
R6018	SM653101450	SM3.92KS
R6019	SM653101397	SM1.10KS
R6020	SM168659007	SM3.0K-1/oo
R6021	SM653101234	SM22.1S
R6022	SM653101297	SM100.0S
R6023	SM653101297	SM100.0S
R7000	SM653101289	SM82.5S
R7001	SM653101308	SM130.0S
R7002	SM653101308	SM130.0S
R7003	SM653101269	SM51.1S
R7004	SM653101289	SM82.5S
R7005	SM653101450	SM3.92KS
R7006	SM653101450	SM3.92KS
R7007	SM653101450	SM3.92KS
R7008	SM653101450	SM3.92KS
RL1000	430430004	RL-RP1-12
RL1001	430430004	RL-RP1-12

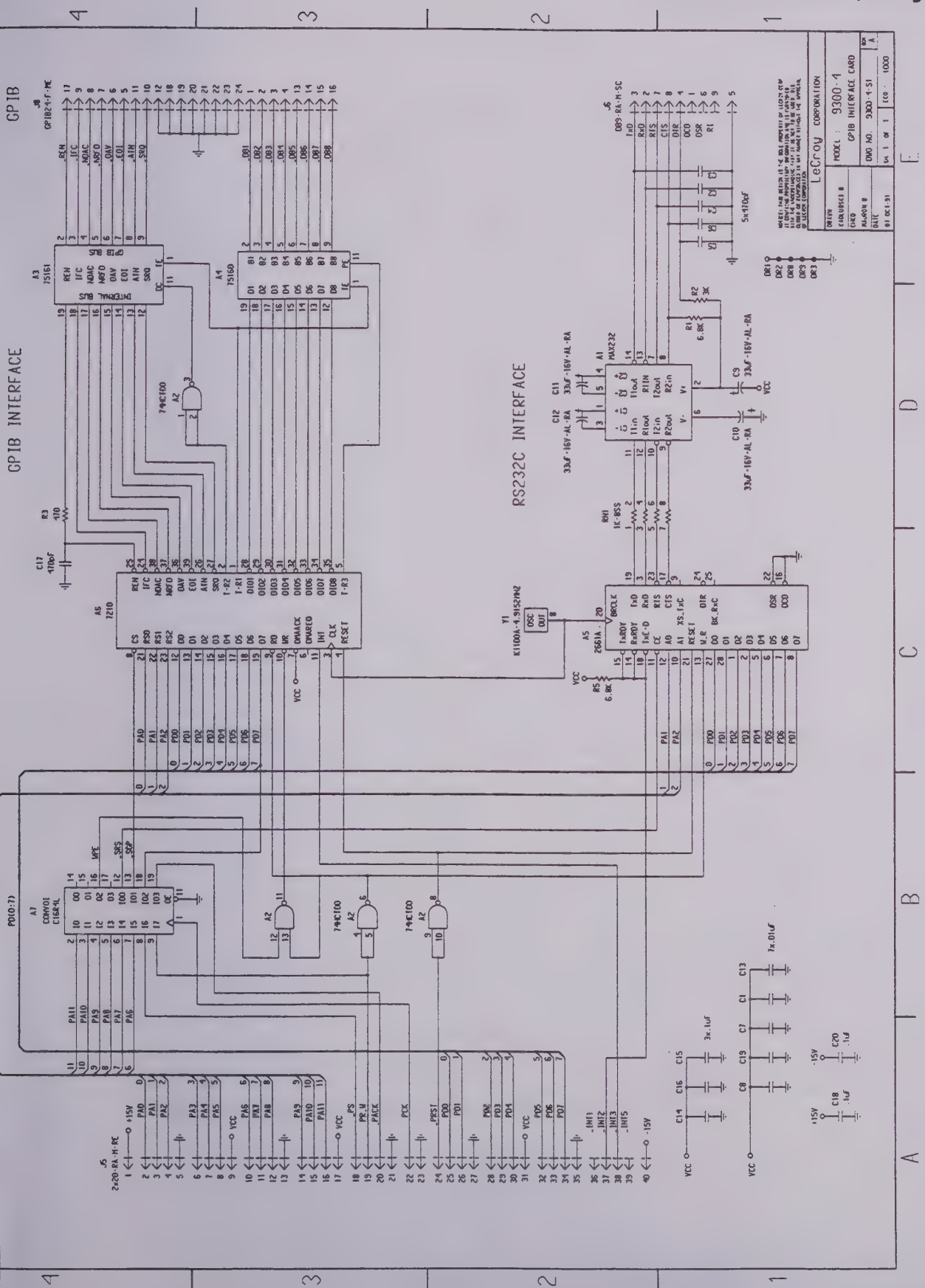
PART: F9384-31 **DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD**

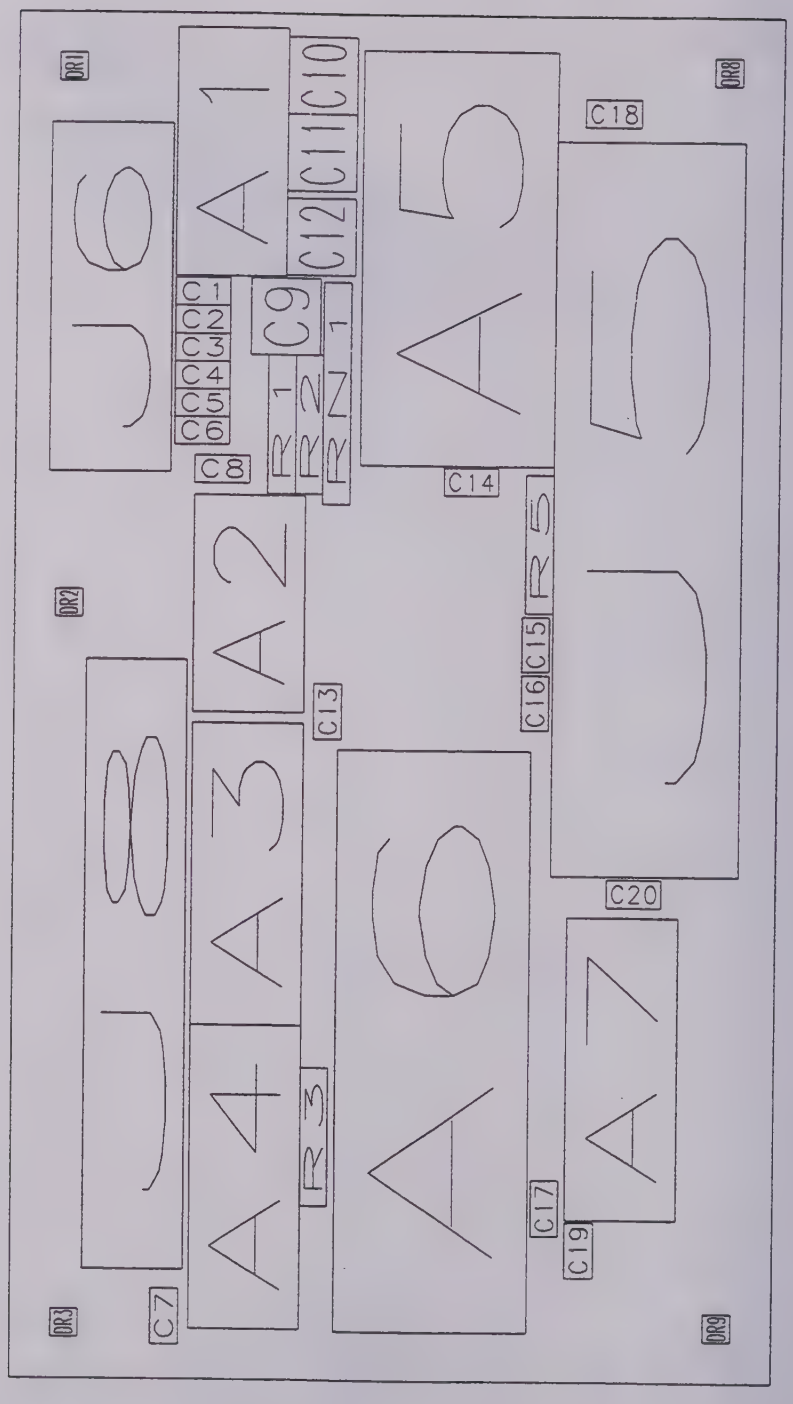
Location	Part Number	Description
RL1002	430430004	RL-RP1-12
RL1003	430490005	RL-RK1-12
RL1004	430430004	RL-RP1-12
RL1005	430490005	RL-RK1-12
RL1006	430430004	RL-TK1-12
RL2000	430430004	RL-RP1-12
RL2001	430430004	RL-RP1-12
RL2002	430430004	RL-RP1-12
RL2003	430490005	RL-RK1-12
RL2004	430430004	RL-RP1-12
RL2005	430490005	RL-RK1-12
RL2006	430430004	RL-TK1-12
RL3000	430430004	RL-RP1-12
RL3001	430430004	RL-RP1-12
RL3002	430430004	RL-RP1-12
RL3003	430490005	RL-RK1-12
RL3004	430430004	RL-RP1-12
RL3005	430490005	RL-RK1-12
RL3006	430430004	RL-TK1-12
RL4000	430430004	RL-RP1-12
RL4001	430430004	RL-RP1-12
RL4002	430430004	RL-RP1-12
RL4003	430490005	RL-RK1-12
RL4004	430430004	RL-RP1-12
RL4005	430490005	RL-RK1-12
RL4006	430430004	RL-TK1-12
RL5000	430490003	RL-TQ2-12
RL5001	430430004	RL-RP1-12
S1	SM654101000	SM0S-2P
TC1000	F9384-7	9384-7
TC2000	F9384-7	9384-7
TC3000	F9384-7	9384-7
TC4000	F9384-7	9384-7
TP201	454313010	2x5-ST-M-NW
TP202	454313010	2x5-ST-M-NW-
TP203	454313010	2x5-ST-M-NW-
TP700	454340002	2x1-ST-M-NW
TP710	454340002	2x1-ST-M-NW
TP720	454340002	2x1-ST-M-NW
TP730	454340002	2x1-ST-M-NW
TP740	454340002	2x1-ST-M-NW
TP750	454340002	2x1-ST-M-NW
TP760	454340002	2x1-ST-M-NW
TP770	454340002	2x1-ST-M-NW
TP800	454340002	2x1-ST-M-NW
TP1001	454312004	2x2-ST-M-NW
TP1500	454313010	2x5-ST-M-NW
TP2001	454312004	2x2-ST-M-NW
TP2500	454313010	2x5-ST-M-NW
TP2501	454312010	2x5-ST-M-NW
TP3001	454312004	2x2-ST-M-NW
TP4001	454312004	2x2-ST-M-NW
TP4500	454313010	2x5-ST-M-NW
TP5000	454340002	2x1-ST-M-NW
TP5500	454313010	2x5-ST-M-NW
TP6000	454710002	2x1-RT-M-NW
U114	C-PAD-010-4	C-PAD-010-4
U336	SM201174011	SM10EL11
U337	SM201174011	SM10EL11
U338	SM201174011	SM10EL11
U339	SM201174011	SM10EL11
U340	SM201174001	SM10EL01
U360	SM201174031	SM10EL31
U361	SM201174031	SM10EL31
U364	SM207970057	SM10EL57
U700	SM205108016	SM24LC16B
U701	SM207970057	SM10EL57
U702	SM207970057	SM10EL57
U703	SM200178002	SM74HCT02
U704	SM201574058	SM10EL58
U726	SM205618594	SM74HC594-PS
U1041	SM201174011	SM10EL11
U1045	SM201174005	SM10EL05
U1046	SM201174005	SM10EL05
U1047	SM201174005	SM10EL05
U1048	SM201174005	SM10EL05
U1054	SM201174011	SM10EL11
U1056	SM201174011	SM10EL11
U1057	SM201174011	SM10EL11
U1500	SM206884623	SM74ABT623
U1501	SM205701070	SRAM128Kx8-70
U1502	MDX622	MDX622A
U1503	HAD621	HAD621A
U1504	SM201174011	SM10EL11
U1505	SM208470347	SMLF347
U1506	SM208470347	SMLF347

PART: F9384-31 DESC : 4 CHAN,1GHZ,1GS/S ACQUISITION BOARD

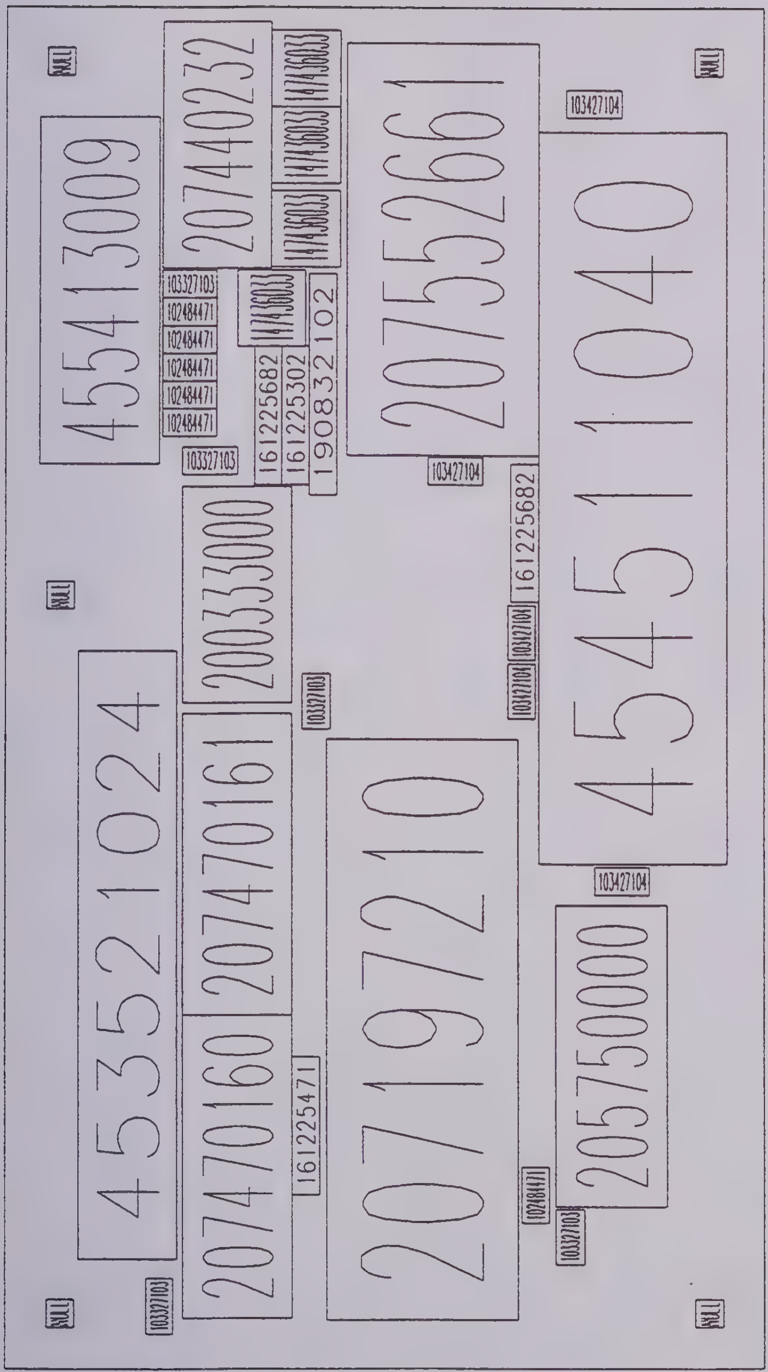
Location	Part Number	Description
U1508	SM208591336	SMLM336-5
U1509	SM208470353	SMLF353
U1510	SM200470573	SM74LVT573
U1511	SM200470573	SM74LVT573
U1530	SM206980056	SM100EL56
U2500	SM206884623	SM74ABT623
U2501	SM205701070	SRAM128Kx8-70
U2502	MDX622	MDX622A
U2503	HAD621	HAD621A
U2504	SM207288800	SMDAC8800
U2505	SM208470347	SMLF347
U2506	SM200170032	SM74F32
U2507	SM207970139	SM74F139
U2511	SM205618594	SM74HC594-PS
U2513	SM201174005	SM10EL05
U2514	SM201174005	SM10EL05
U2515	SM201174005	SM10EL05
U2516	SM201174005	SM10EL05
U2517	SM201174011	SM10EL11
U2518	SM201174011	SM10EL11
U2520	SM201174011	SM10EL11
U2521	SM208470347	SMLF347
U2522	SM207288800	SMDAC8800
U2523	SM206980056	SM100EL56
U2524	SM201174011	SM10EL11
U2530	SM206980056	SM100EL56
U2540	SM206980056	SM100EL56
U2541	SM201174011	SM10EL11
U2542	SM201174011	SM10EL11
U3453	SM206980056	SM100EL56
U3500	SM206884623	SM74ABT623
U3501	SM205701070	SRAM128Kx8-70
U3502	MDX622	MDX622A
U3503	HAD621	HAD621A
U3504	SM201174011	SM10EL11
U3505	SM208470347	SMLF347
U3506	SM208470347	SMLF347
U3507	SM207288800	SMDAC8800
U3512	SM201174005	SM10EL05
U3513	SM201174005	SM10EL05
U3514	SM201174005	SM10EL05
U3515	SM201174005	SM10EL05

Location	Part Number	Description
U3516	SM201174011	SM10EL11
U3517	SM201174011	SM10EL11
U3519	SM201174011	SM10EL11
U3520	SM208470347	SMLF347
U3521	SM205618594	SM74HC594-PS
U3530	SM206980056	SM100EL56
U3540	SM206980056	SM100EL56
U3541	SM201174011	SM10EL11
U3542	SM201174011	SM10EL11
U4500	SM206884623	SM74ABT623
U4501	SM205701070	SRAM128Kx8-70
U4502	MDX622	MDX622A
U4503	HAD621	HAD621A
U4504	SM208470347	SMLF347
U4510	SM201174005	SM10EL05
U4511	SM201174005	SM10EL05
U4512	SM201174005	SM10EL05
U4513	SM201174005	SM10EL05
U4514	SM201174011	SM10EL11
U4515	SM201174011	SM10EL11
U4517	SM201174011	SM10EL11
U4520	SM200470573	SM74LVT573
U4521	SM200470573	SM74LVT573
U4522	SM200170032	SM74F32
Y700	311210000	OSC-18D10MHz
Y5001	SM311414318	SM14.31818MHz


GPIB INTERFACE
RS232C INTERFACE
GPIB
LeCroy CORPORATION
MODEL : 9300-1
GPIB INTERFACE CARD
DWG NO. 9300-1-S1
SH 1 OF 1
ECO : 1000
A1 MAX232
A3 75161
A4 75160
A5 2661A
A6 7210
A7 CONVOI C16R4L
Y1 K1100A-4.9152MHZ
J5 2x20-RA-M-RE
J6 DB9-RA-M-SC
J8 GPIB24-F-ME
C17 470pF
R3 470
R5 6.8K
R1 6.8K
R2 3K
C9 33uF-16V-AL-RA
C10 33uF-16V-AL-RA
C11 33uF-16V-AL-RA
C12 33uF-16V-AL-RA
5x470pF
VCC
+15V
-15V

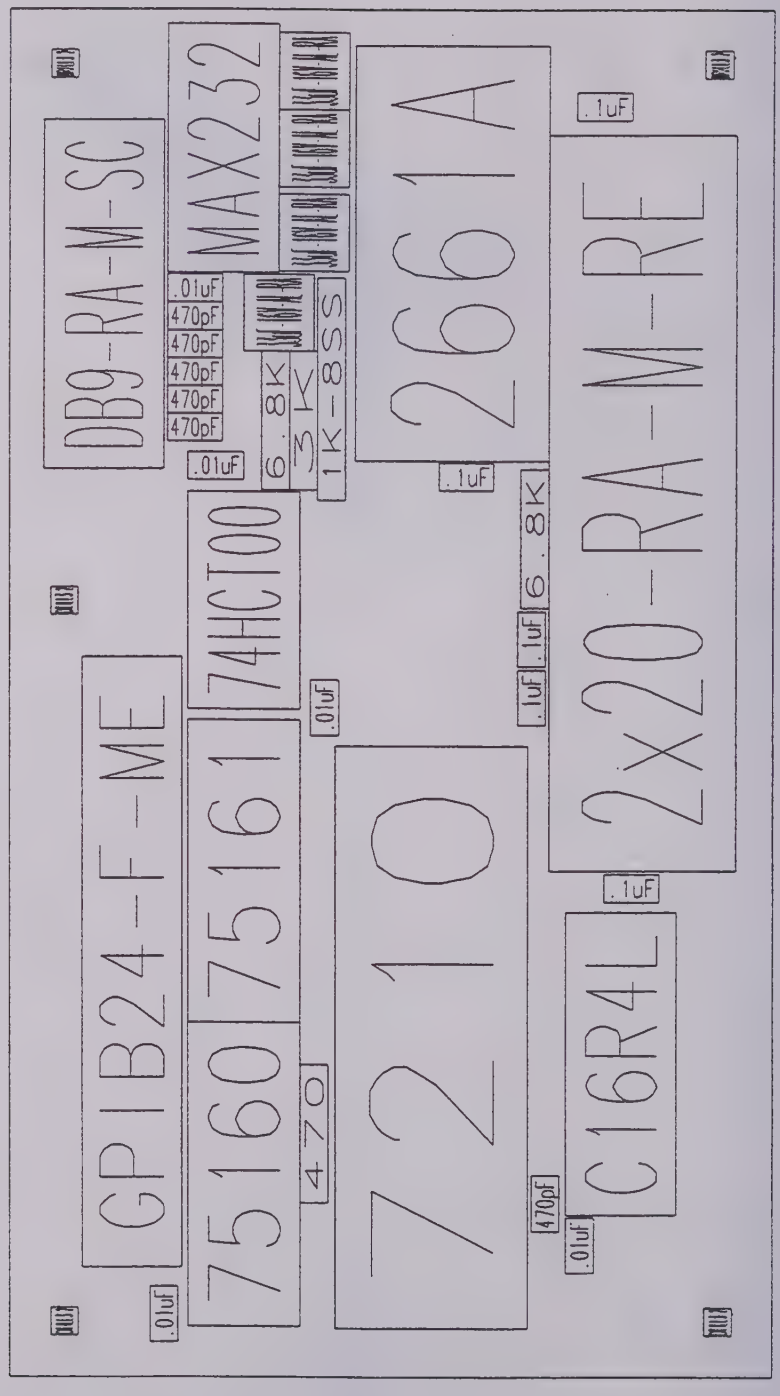

J6
A1
C10
C11
C12
A5
C18
J5
DR1
DR8
C1
C2
C3
C4
C5
C6
C9
R1
R2
R4
C8
C14
R5
DR2
A2
C16
C15
C13
J8
A3
A6
C20
A4
R3
A7
C17
C19
C7
DR3
DR9

9300-4 REV:D


4554413009
2074440232
2075526661
4545111040
2003330000
4535521024
2074470161
2074470160
2071972210
2057500000
1612225682
1612225302
1908321102
1612225471

9300-4 REV:D

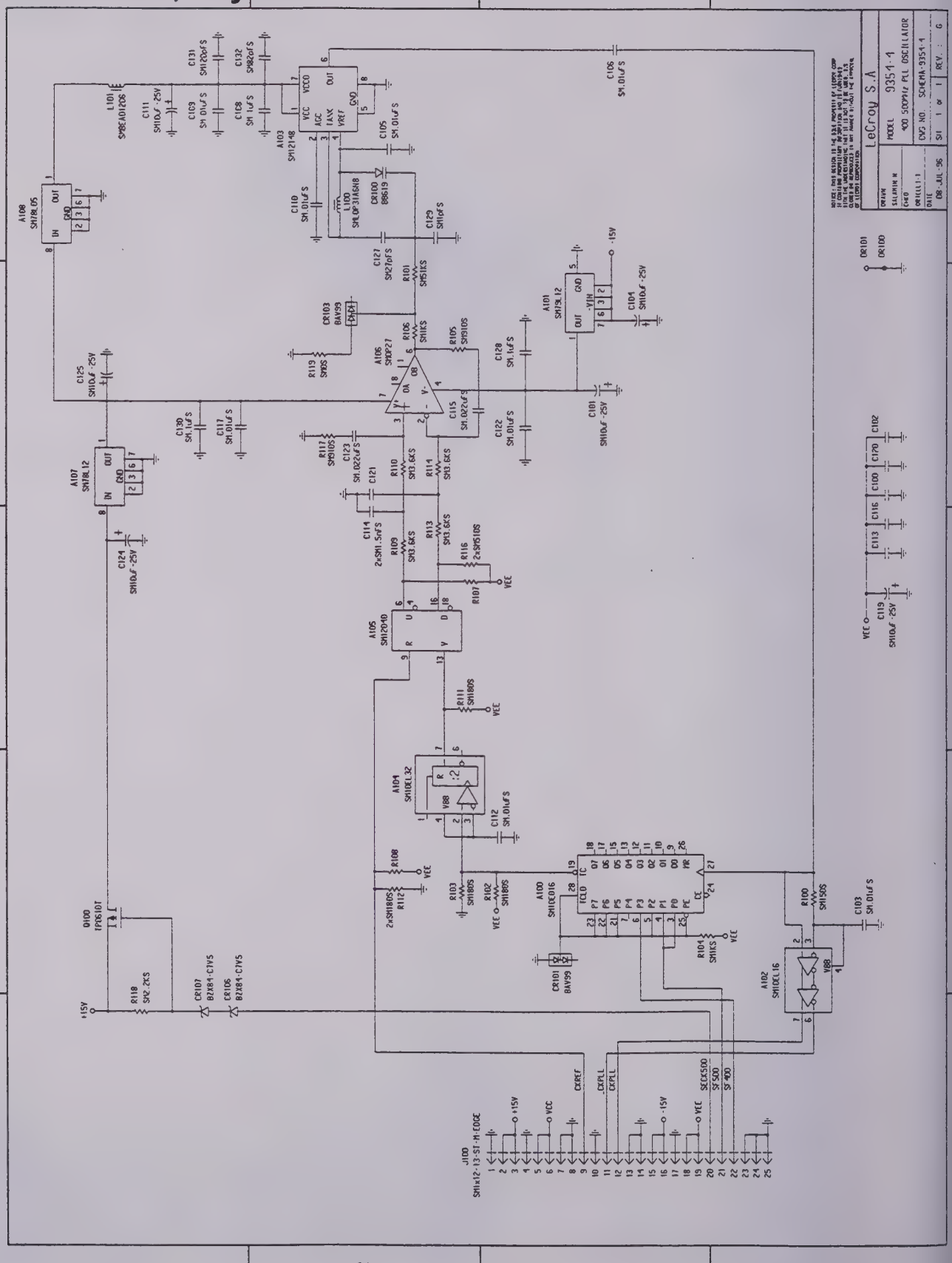
Schematics, Layouts

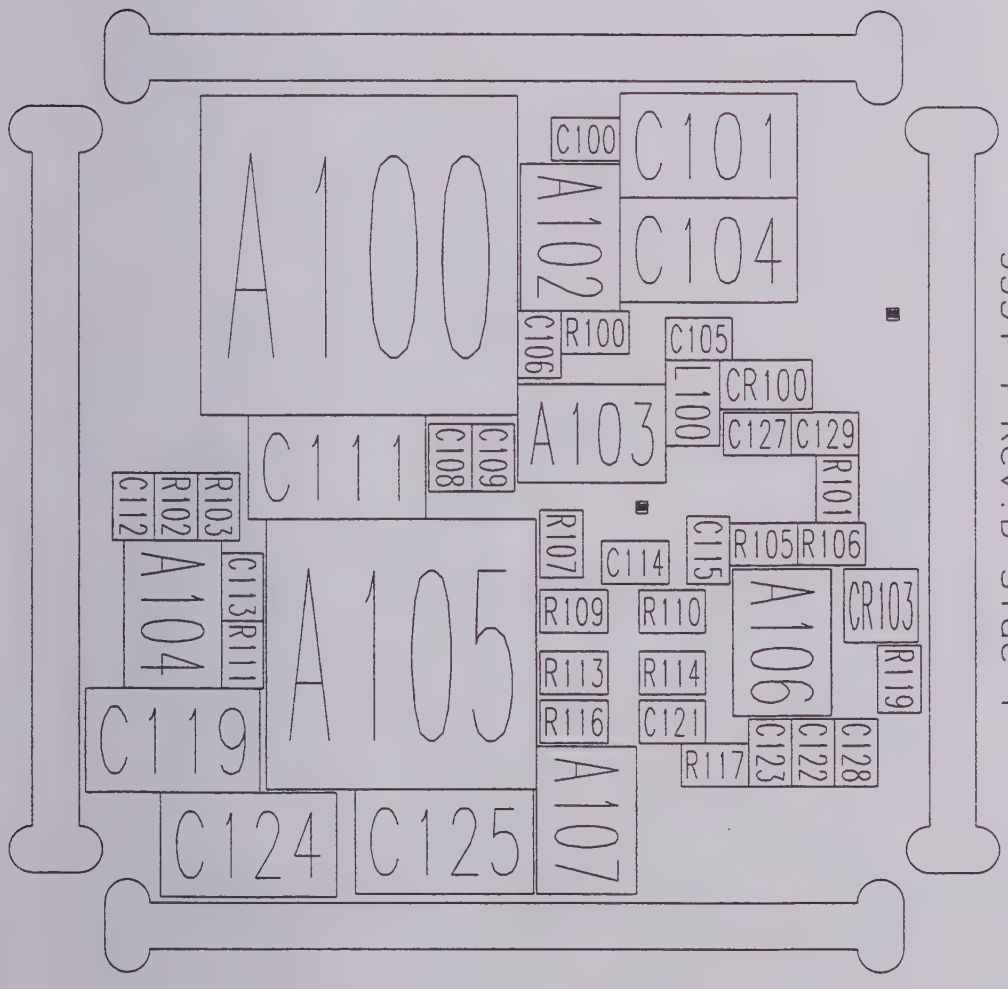


9300-4 REV:D

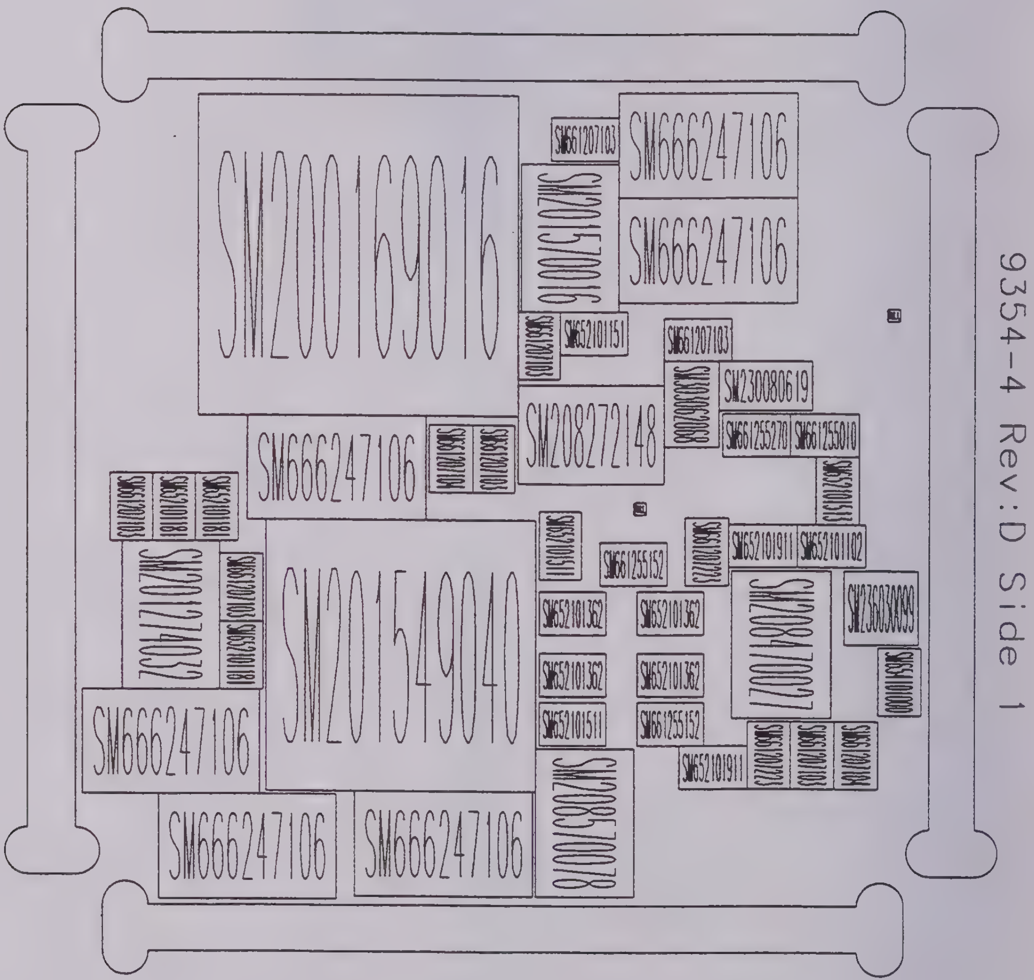
PART: F9300-4 **DESC : GPIB & RS232 Card**

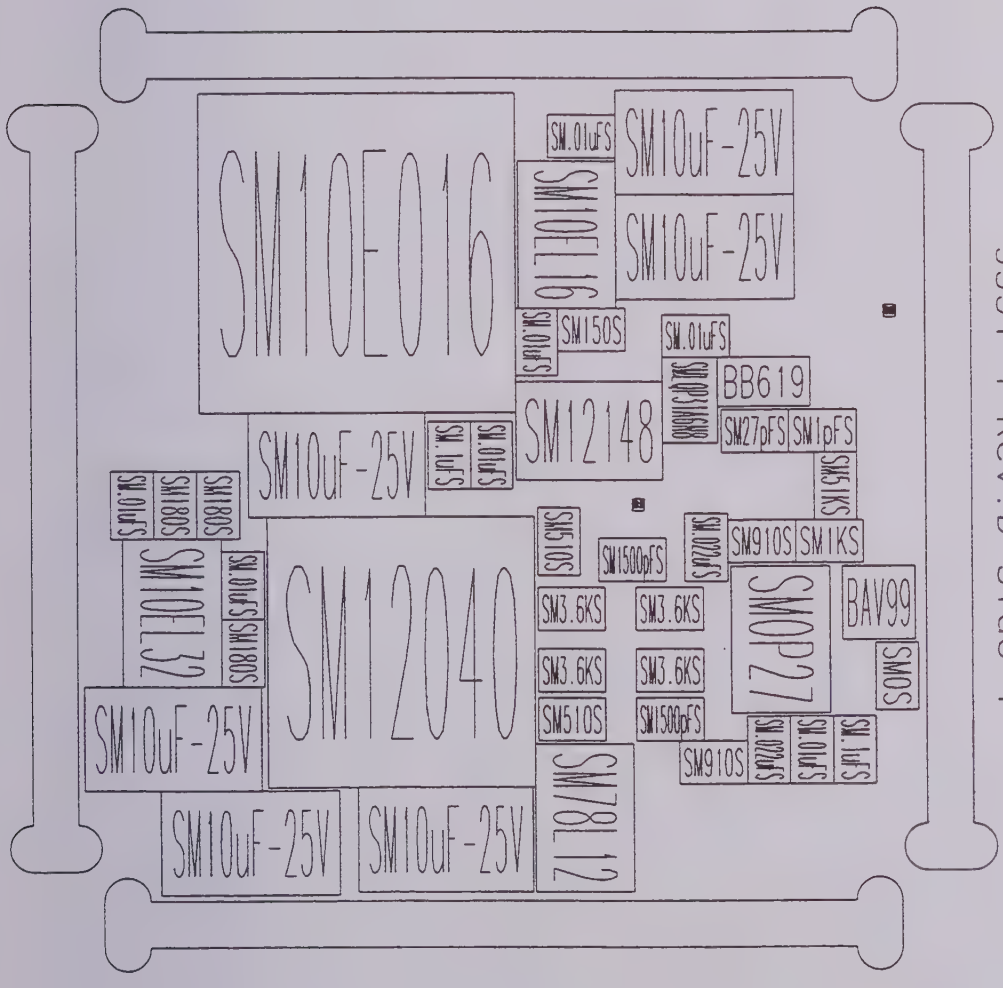
Location	Part Number	Description	Location	Part Number	Description
A1	207440232	MAX232	C11	147436033	33uF-16V
A2	200333000	74HCT00	C12	147436033	33uF-16V
A3	207470161	75161	C13	103327103	01uF
A4	207470160	75160	C14	103427104	.1uF
A5	207552661	2661A	C15	103427104	.1uF
A6	207197210	7210	C16	103427104	.1uF
A7	205750000	C16R4L	C17	102484471	470pF
C1	103327103	.01uF	C18	103427104	.1uF
C2	102484471	470pF	C19	103327103	.01uF
C3	102484471	470pF	C20	103427104	.1uF
C4	102484471	470pF	J5	454511040	2x20-RA-M-RE
C5	102484471	470pF	J6	455413009	DB9-RA-M-SC
C6	102484471	470pF	J8	453521024	GPIB24-F-ME
C7	103327103	.01uF	R1	161225682	6.8K
C8	103327103	.01uF	R2	161225302	3K
C9	147436033	33uF-16V	R3	161225471	470
C10	147436033	33uF-16V	R5	161225682	6.8K
			RN1	190832102	1K-8SS

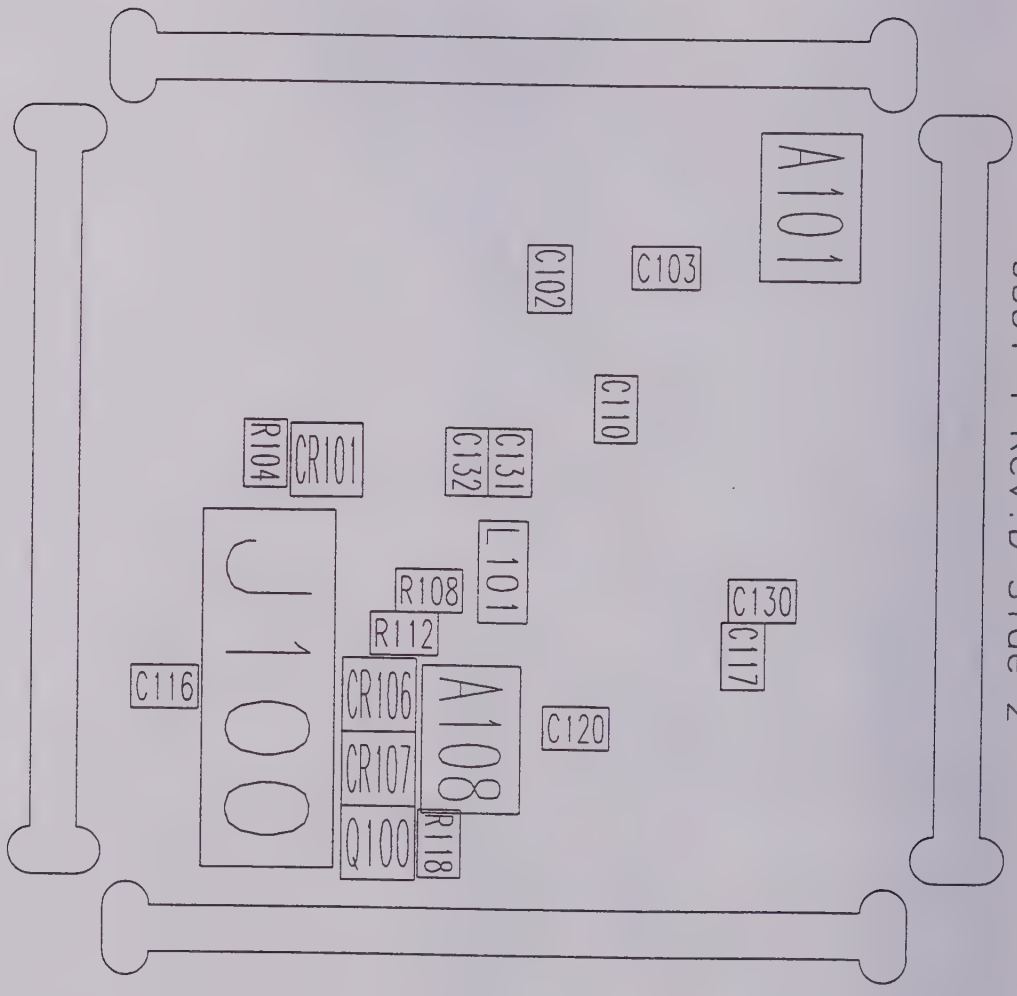

LeCroy S.A.
MODEL 9351-1
400 500MHz PLL OSCILLATOR
SCHEMA-9351-1
A100 SM10C016
A101 SM139_12
A102 SM10EL16
A103 SM1248
A104 SM10EL32
A105 SM12040
A106 SM0P27
A107 SM78L12
A108 SM78L05
Q100 IPA610T
J100 SM1x12-13-ST-M-EDGE
+15V
-15V
VCC
VEE
CKREF
CKPLL
SCLK500
SF500
SF400

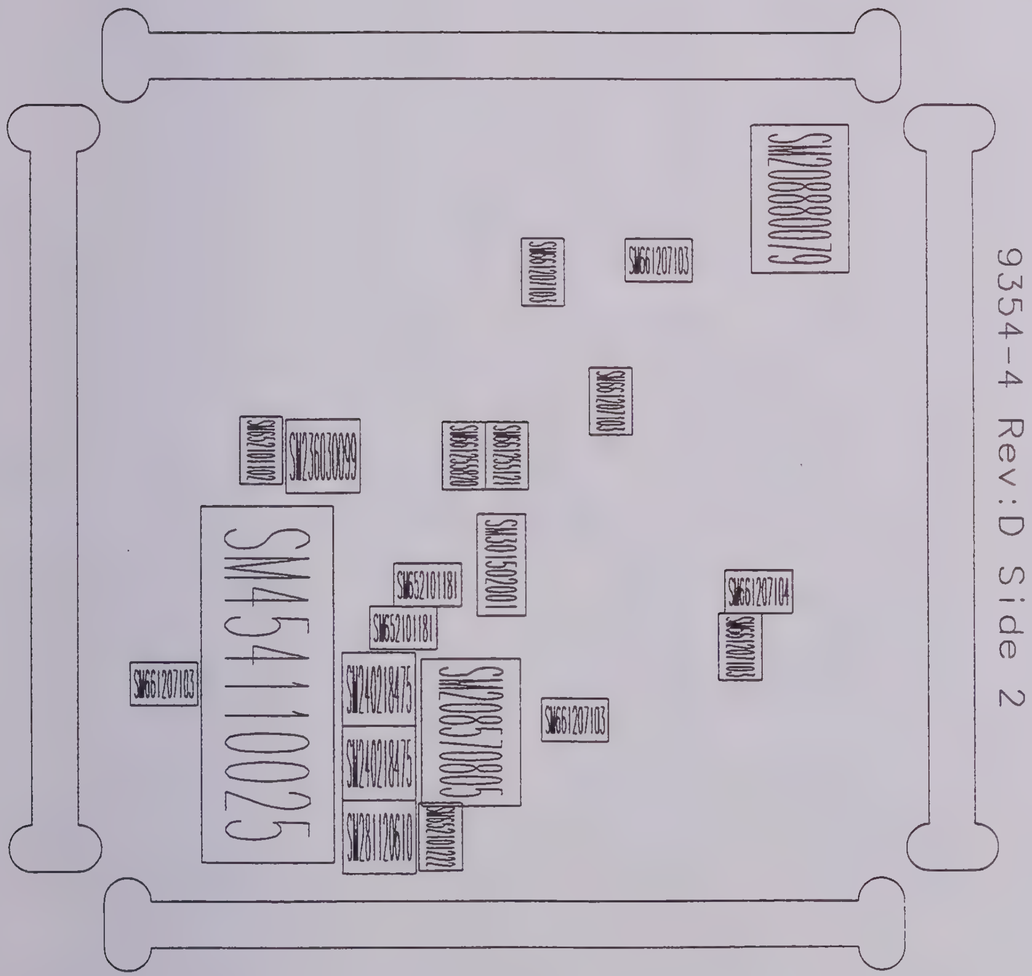


9354-4 Rev:D Side 1

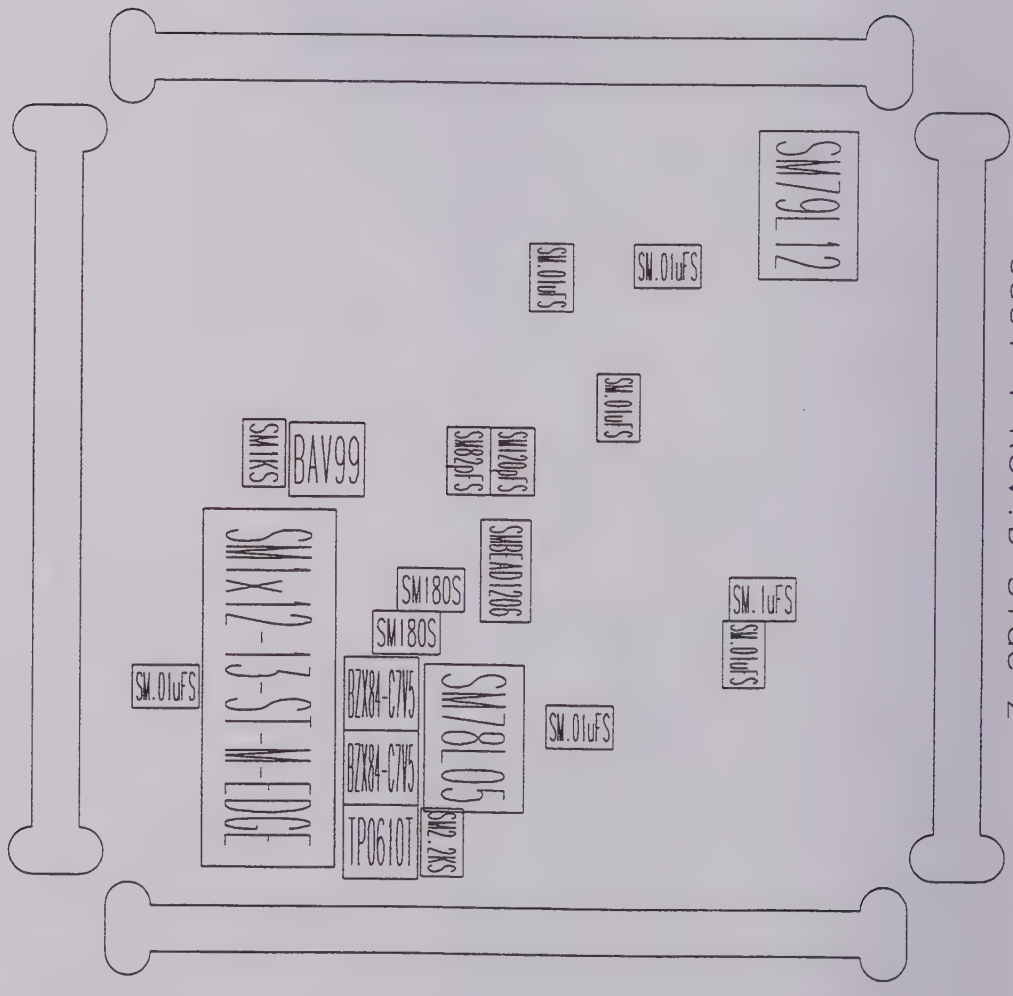

9354-4 Rev:D Side 1
SM200169016
SM666247106
SM666247106
SM201570016
SM208272148
SM230080619
SM666247106
SM201549040
SM201274032
SM208470027
SM666247106
SM666247106
SM666247106
SM208570078


SM10E016
SM.01uFS
SM10uF-25V
SM10EL16
SM10uF-25V
SM.01uFS
SM150S
SM.01uFS
BB619
SM12148
SM27pFS
SM1pFS
SM10uF-25V
SM.1uFS
SM.01uFS
SM51KS
SM.01uFS
SM180S
SM180S
SM10EL32
SM.01uFS
SM180S
SM12040
SM510S
SM1500pFS
SM.022uFS
SM910S
SM1KS
SM3.6KS
SM3.6KS
SM3.6KS
SM3.6KS
SM510S
SM1500pFS
SMOP27
BAV99
SMOS
SM10uF-25V
SM910S
SM.022uFS
SM.01uFS
SM.1uFS
SM78L12
SM10uF-25V
SM10uF-25V
9354-4 Rev:D Side 1


A101
C102
C103
C110
R104
CR101
C131
C132
L101
R108
R112
C130
C117
C116
J100
CR106
CR107
Q100
A108
C120
R118
9354-4 Rev:D Side 2


9354-4 Rev:D Side 2
SM4541110025
SM661207103
SM661207104
SM652101181
SM240218475
SM281120610

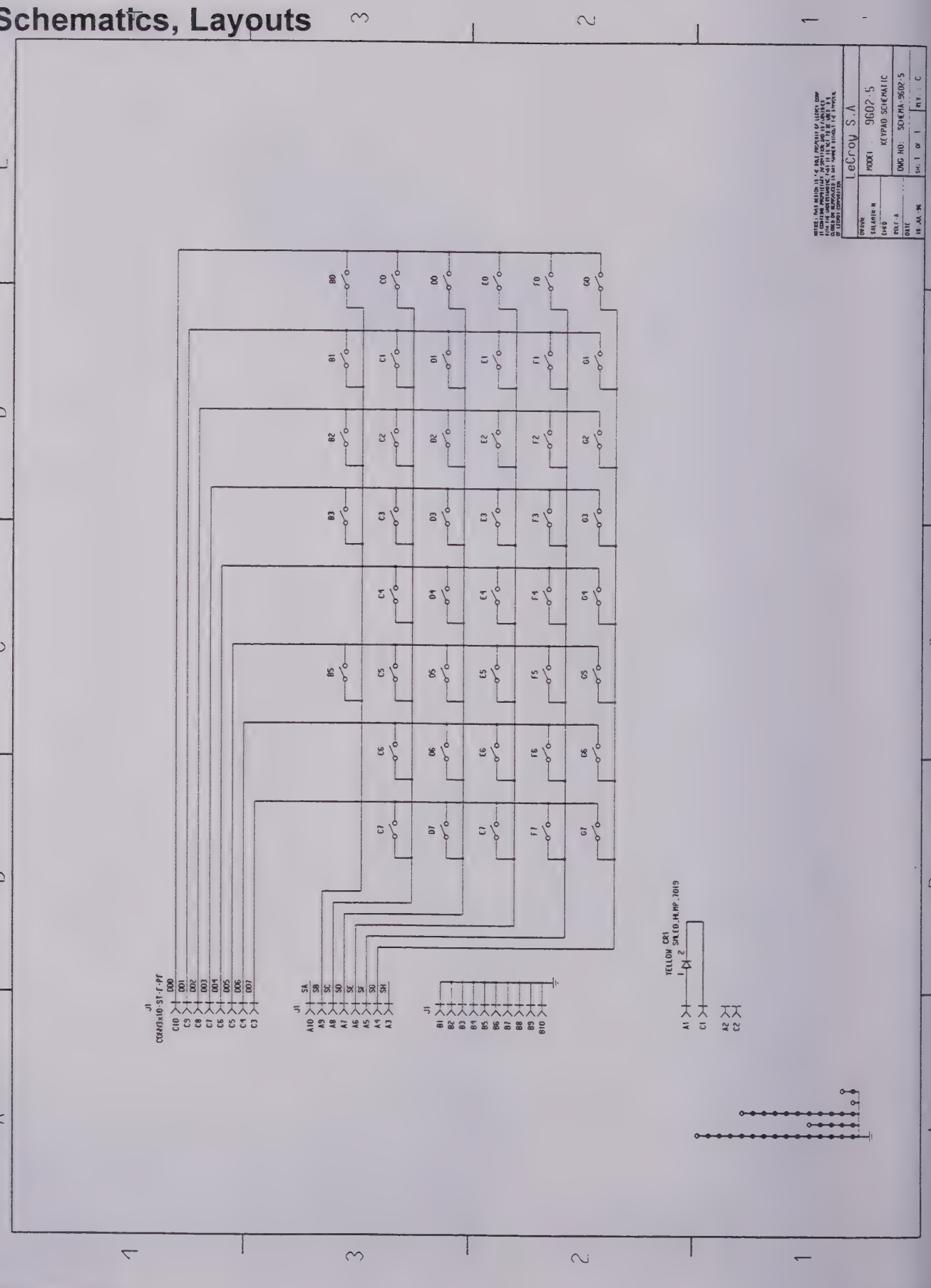
Schematics, Layouts

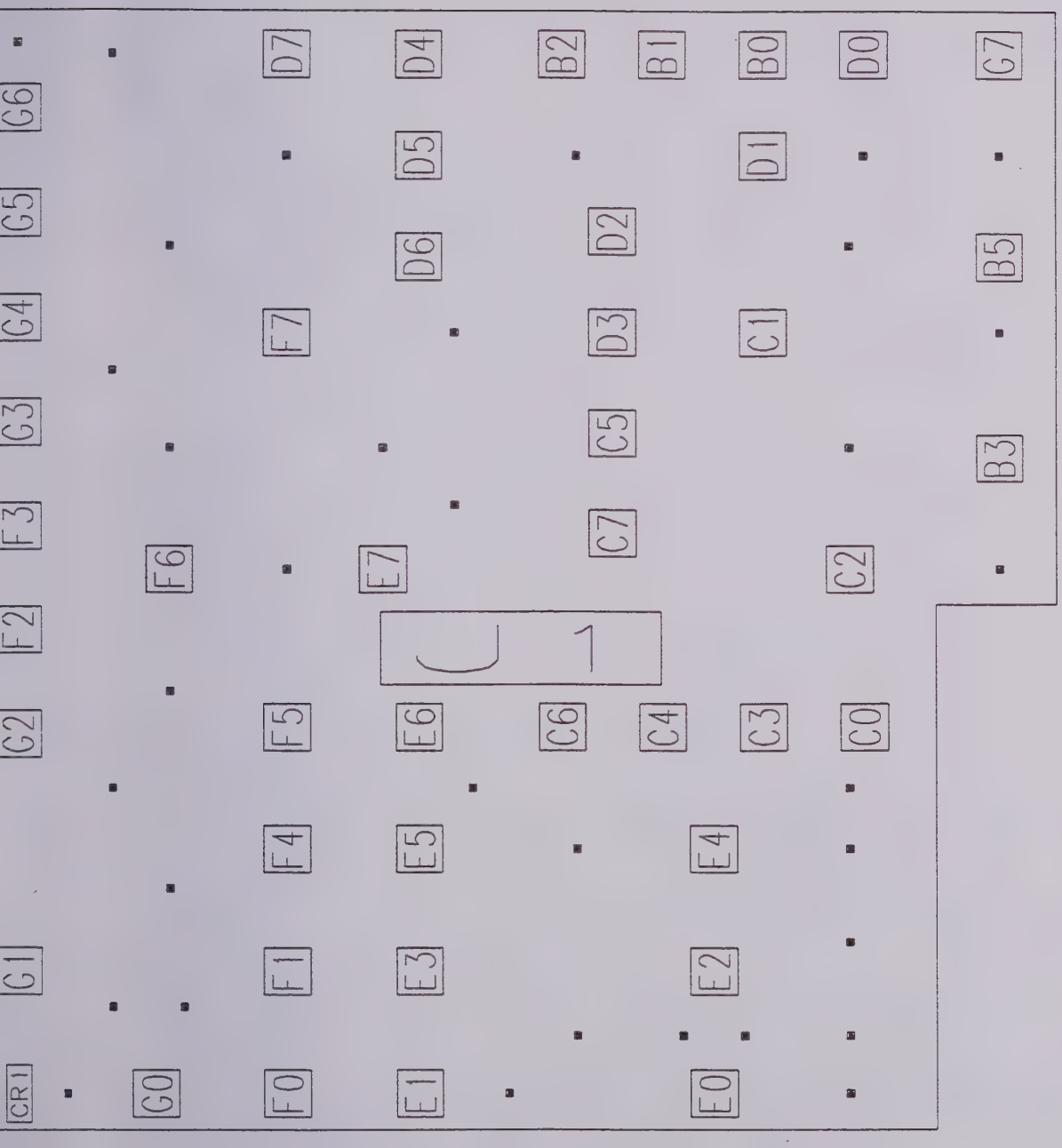


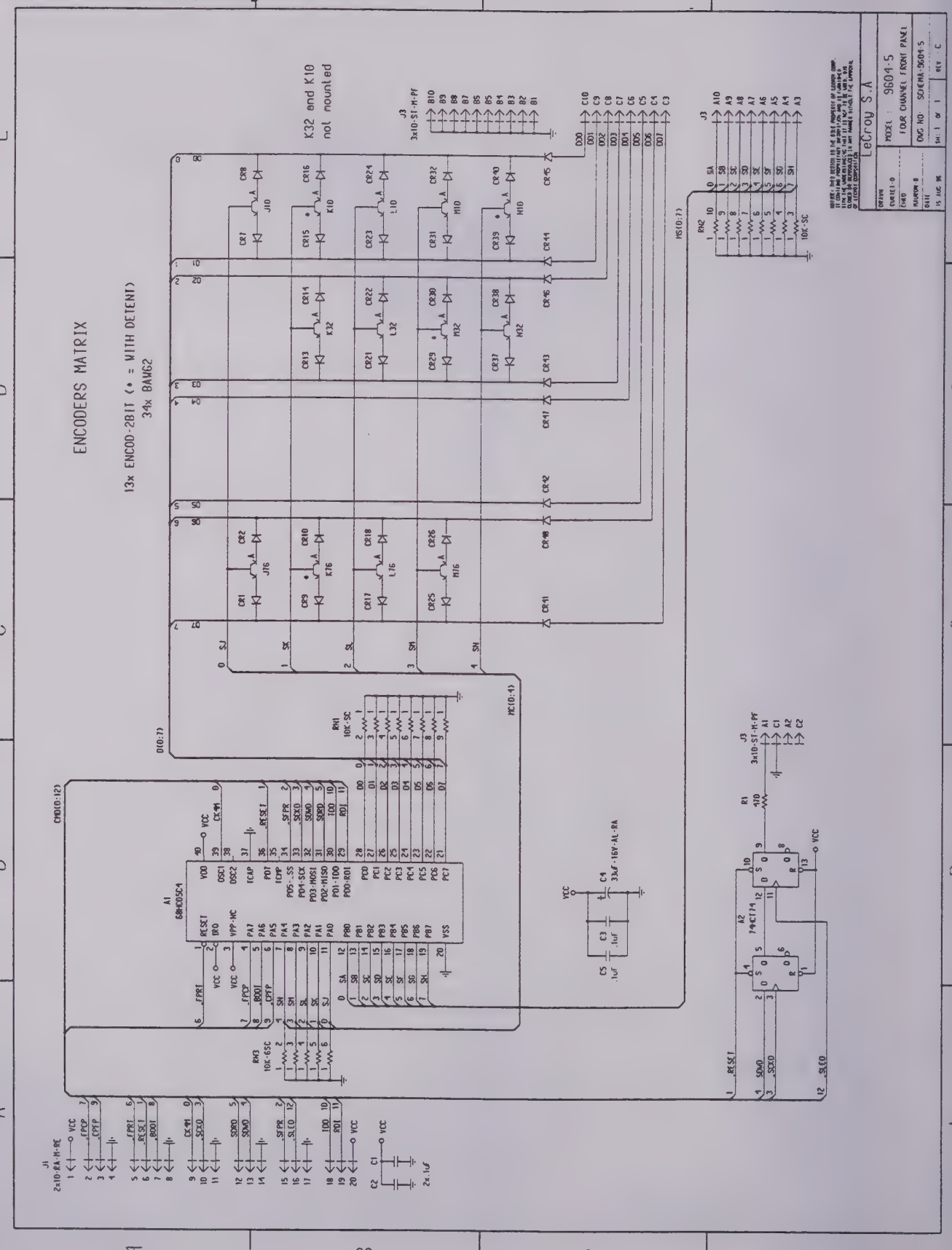
PART: F9354-4 **DESC : Time Base Card**

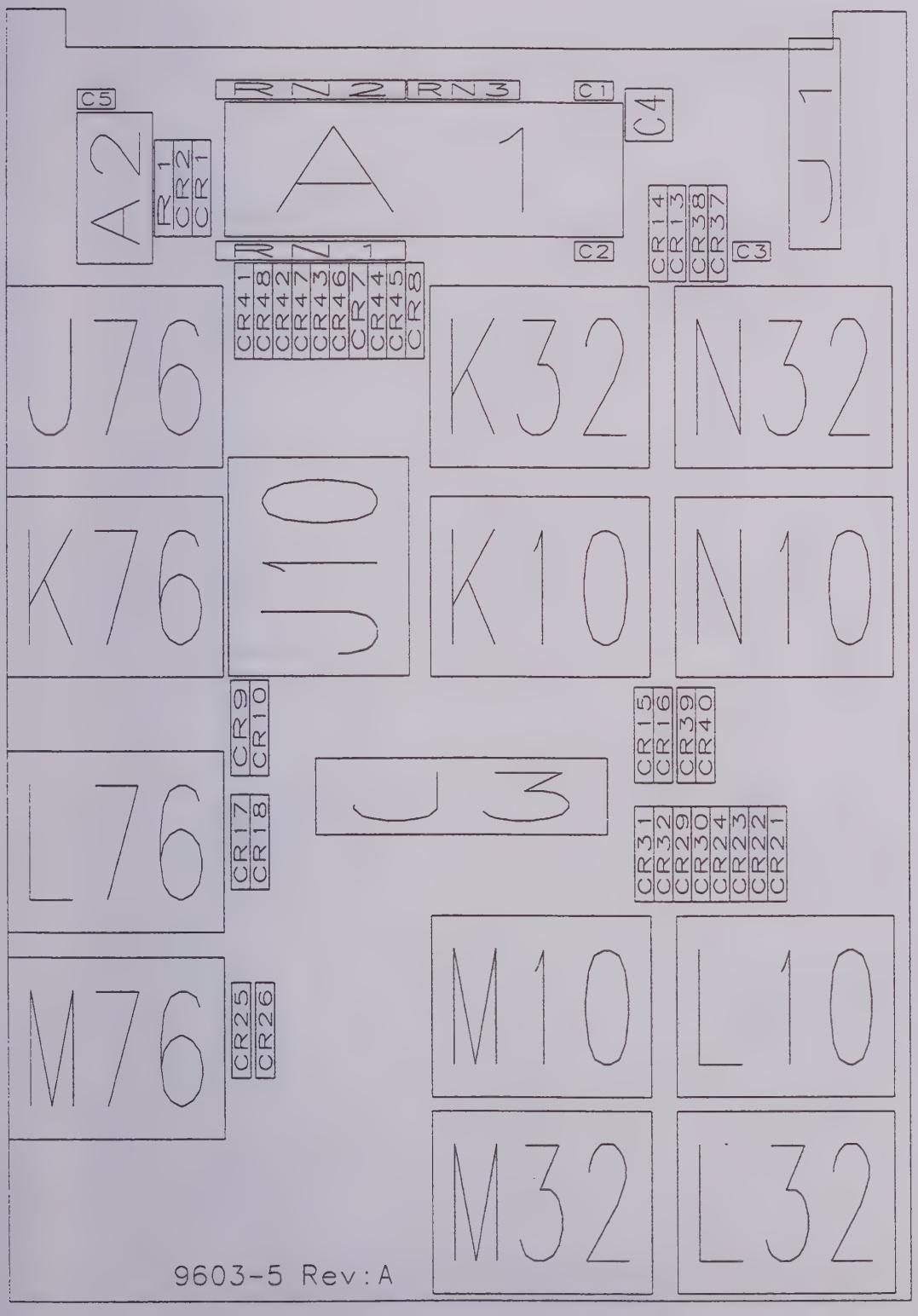
Location	Part Number	Description	Location	Part Number	Description
A100	SM200169016	SM10E016	C127	SM661255270	SM27pFS
A101	SM208880079	SM79L12	C128	SM661207104	SM.1uFS
A102	SM201570016	SM10EL16	C129	SM661255010	SM1pFS
A103	SM208272148	SM12148	C130	SM661207104	SM.1uFS
A104	SM201274032	SM10EL32	C131	SM661255121	SM120pFS
A105	SM201549040	SM12040	C132	SM661255820	SM82pFS
A106	SM208470027	SMOP27	CR100	SM230080619	BB619
A107	SM208570078	SM78L12	CR101	SM236030099	BAV99
A108	SM208570805	SM78L05	CR103	SM236030099	BAV99
C100	SM661207103	SM.01uFS	CR106	SM240218475	BZX84-C7V5
C101	SM666247106	SM10uF-25V	CR107	SM240218475	BZX84-C7V5
C102	SM661207103	SM.01uFS	J100	SM454110025	SM1x12
C103	SM661207103	SM.01uFS	L100	SM303062068	SMLQP31A6N8
C104	SM666247106	SM10uF-25V	L101	SM301502001	SMBEAD1206
C105	SM661207103	SM.01uFS	Q100	SM281120610	TP0610T
C106	SM661207103	SM.01uFS	R100	SM652101151	SM150S
C108	SM661207104	SM.1uFS	R101	SM652101513	SM51KS
C109	SM661207103	SM.01uFS	R102	SM652101181	SM180S
C110	SM661207103	SM.01uFS	R103	SM652101181	SM180S
C111	SM666247106	SM10uF-25V	R104	SM652101102	SM1KS
C112	SM661207103	SM.01uFS	R105	SM652101911	SM910S
C113	SM661207103	SM.01uFS	R106	SM652101102	SM1KS
C114	SM661255152	SM1500pFS	R107	SM652101511	SM510S
C115	SM661207223	SM.022uFS	R108	SM652101181	SM180S
C116	SM661207103	SM.01uFS	R109	SM652101362	SM3.6KS
C117	SM661207103	SM.01uFS	R110	SM652101362	SM3.6KS
C119	SM666247106	SM10uF-25V	R111	SM652101181	SM180S
C120	SM661207103	SM.01uFS	R112	SM652101181	SM180S
C121	SM661255152	SM1500pFS	R113	SM652101362	SM3.6KS
C122	SM661207103	SM.01uFS	R114	SM652101362	SM3.6KS
C123	SM661207223	SM.022uFS	R116	SM652101511	SM510S
C124	SM666247106	SM10uF-25V	R117	SM652101911	SM910S
C125	SM666247106	SM10uF-25V	R118	SM652101222	SM2.2KS
			R119	SM654101000	SM0S

Schematics, Layouts

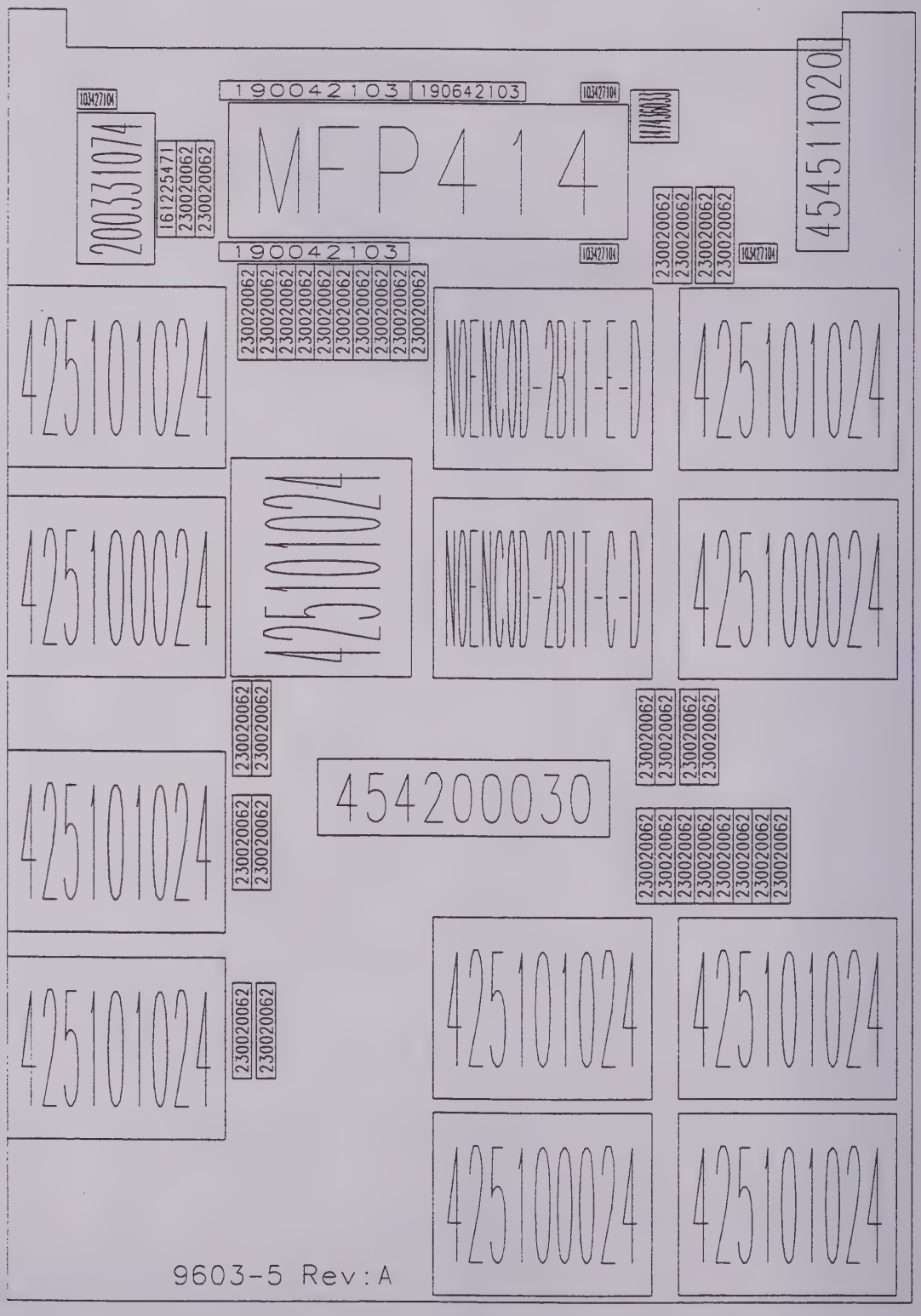


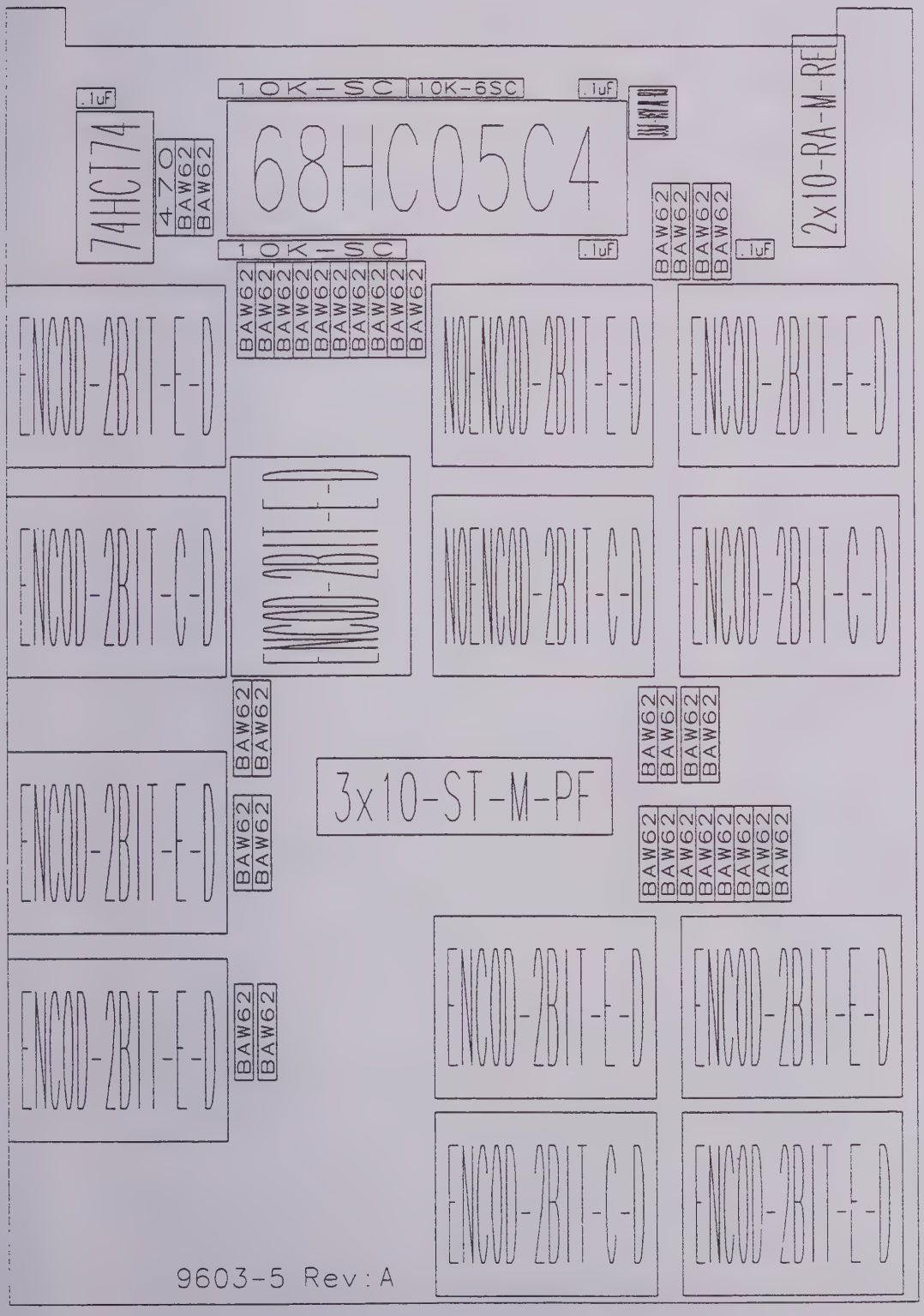

D7
D4
B2
B1
B0
D0
G7
G6
D5
D1
G5
D2
D6
B5
G4
F7
D3
C1
G3
C5
B3
F3
C7
F6
E7
C2
F2
G2
F5
E6
C6
C4
C3
C0
F4
E5
E4
G1
F1
E3
E2
CR1
G0
F0
E1
E0
02-5 Rev:C


ENCODERS MATRIX
13x ENCOD-2BIT (• = WITH DETENT)
34x BAW62
K32 and K10
not mounted
LeCroy S.A
MODEL : 9604-5
FOUR CHANNEL FRONT PANEL
DWG NO: SCHEMA-9604-5
REV : C
DRAWN
CHECKED
APPROVED
DATE
15 AUG 96
SHT 1 OF 1
A1
68HC05C4
A2
74HCT14
J1
2x10-KA-M-RE
J3
3x10-ST-M-PF
RN1
10K-SC
RN2
10K-SC
RN3
10K-6SC
C1
2x.1uF
C2
2x.1uF
C3
.1uF
C4
33uF-16V-AL-RA
C5
.1uF
R1
470
CR1
J76
CR2
CR9
K76
CR10
CR17
L76
CR18
CR25
M76
CR26
CR33
K32
CR34
CR21
L32
CR22
CR29
M32
CR30
CR37
M32
CR38
CR41
CR42
CR45
J10
CR7
CR8
CR15
K10
CR16
CR23
L10
CR24
CR31
M10
CR32
CR39
M10
CR40
CR44
CR47
CR48
DIO(7:)
MC(0:4)
MS(0:7)
CMD(0:12)
VCC
RESET
SDAO
SDAI
SCLO
SCLI


C5
A2
R1
CR2
CR1
RN2
RN3
C1
A1
C4
J1
RN1
C2
CR14
CR13
CR38
CR37
C3
CR41
CR48
CR42
CR47
CR43
CR46
CR7
CR44
CR45
CR8
J76
K32
N32
K76
J10
K10
N10
CR9
CR10
CR15
CR16
CR39
CR40
J3
L76
CR17
CR18
CR31
CR32
CR29
CR30
CR24
CR23
CR22
CR21
M10
L10
M76
CR25
CR26
M32
L32
9603-5 Rev:A

Schematics, Layouts



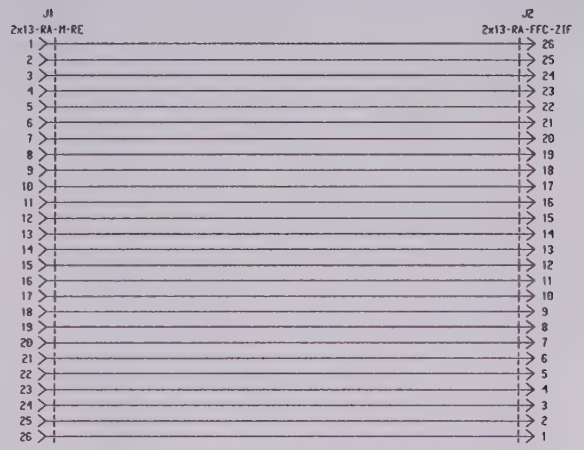

.1uF
74HCT74
470
BAW62
BAW62
10K-SC
10K-6SC
.1uF
68HC05C4
10K-SC
.1uF
.1uF
2x10-RA-M-REL
BAW62
ENCOD-2BIT-E-D
NOEENCOD-2BIT-E-D
ENCOD-2BIT-C-D
NOEENCOD-2BIT-C-D
3x10-ST-M-PF
9603-5 Rev:A

PART: F9602-5 **DESC : Front Panel Keypad**

Location	Part Number	Description
CR1	SMLEDP7019	HLMP_7019
J1	3x10-ST-F	CONN3x10-ST-F

PART: F9604-5 **DESC : Front Panel**

Location	Part Number	Description	Location	Part Number	Description
A1	MFP414	68HC05C4	CR37	230020062	BAW62
A2	200331074	74HCT74	CR38	230020062	BAW62
C1	103427104	.1uF	CR39	230020062	BAW62
C2	103427104	.1uF	CR40	230020062	BAW62
C3	103427104	.1uF	CR41	230020062	BAW62
C4	147436033	33uF-16V	CR42	230020062	BAW62
C5	103427104	.1uF	CR43	230020062	BAW62
CR1	230020062	BAW62	CR44	230020062	BAW62
CR2	230020062	BAW62	CR45	230020062	BAW62
CR7	230020062	BAW62	CR46	230020062	BAW62
CR8	230020062	BAW62	CR47	230020062	BAW62
CR9	230020062	BAW62	CR48	230020062	BAW62
CR10	230020062	BAW62	J1	454511020	2x10-RA-M-RE
CR13	230020062	BAW62	J3	454200030	3x10-ST-M-PF
CR14	230020062	BAW62	J10	425101024	ENCOD-2BIT
CR15	230020062	BAW62	J76	425101024	ENCOD-2BIT
CR16	230020062	BAW62	K76	425100024	ENCOD-2BIT
CR17	230020062	BAW62	L10	425101024	ENCOD-2BIT
CR18	230020062	BAW62	L32	425101024	ENCOD-2BIT
CR21	230020062	BAW62	L76	425101024	ENCOD-2BIT
CR22	230020062	BAW62	M10	425101024	ENCOD-2BIT
CR23	230020062	BAW62	M32	425100024	ENCOD-2BIT
CR24	230020062	BAW62	M76	425101024	ENCOD-2BIT
CR25	230020062	BAW62	N10	425100024	ENCOD-2BIT
CR26	230020062	BAW62	N32	425101024	ENCOD-2BIT
CR29	230020062	BAW62	R1	161225471	470
CR30	230020062	BAW62	RN1	190042103	10K-SC
CR31	230020062	BAW62	RN2	190042103	10K-SC
CR32	230020062	BAW62	RN3	190642103	10K-6SC



REMARQUE: THE PIN 1 OFF THE FLOPPY DISK DRIVE
IS CONNECTED TO THE PIN 1 OF THE ORIGINAL
FLAT CABLE. (THE REVERSE CONNECTION IS ONLY
A MECHANICAL GEOMETRY COMPATIBILITY).

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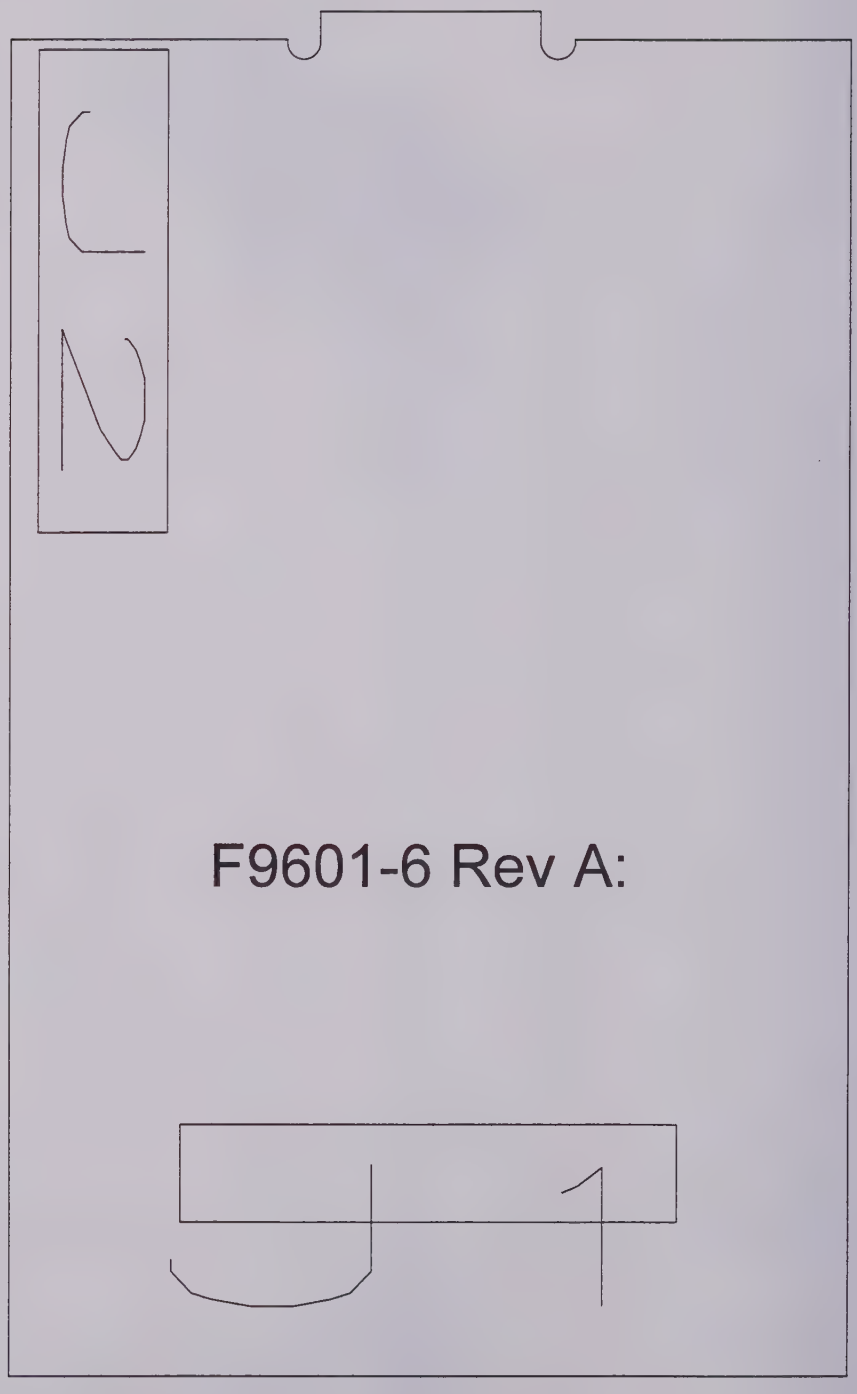
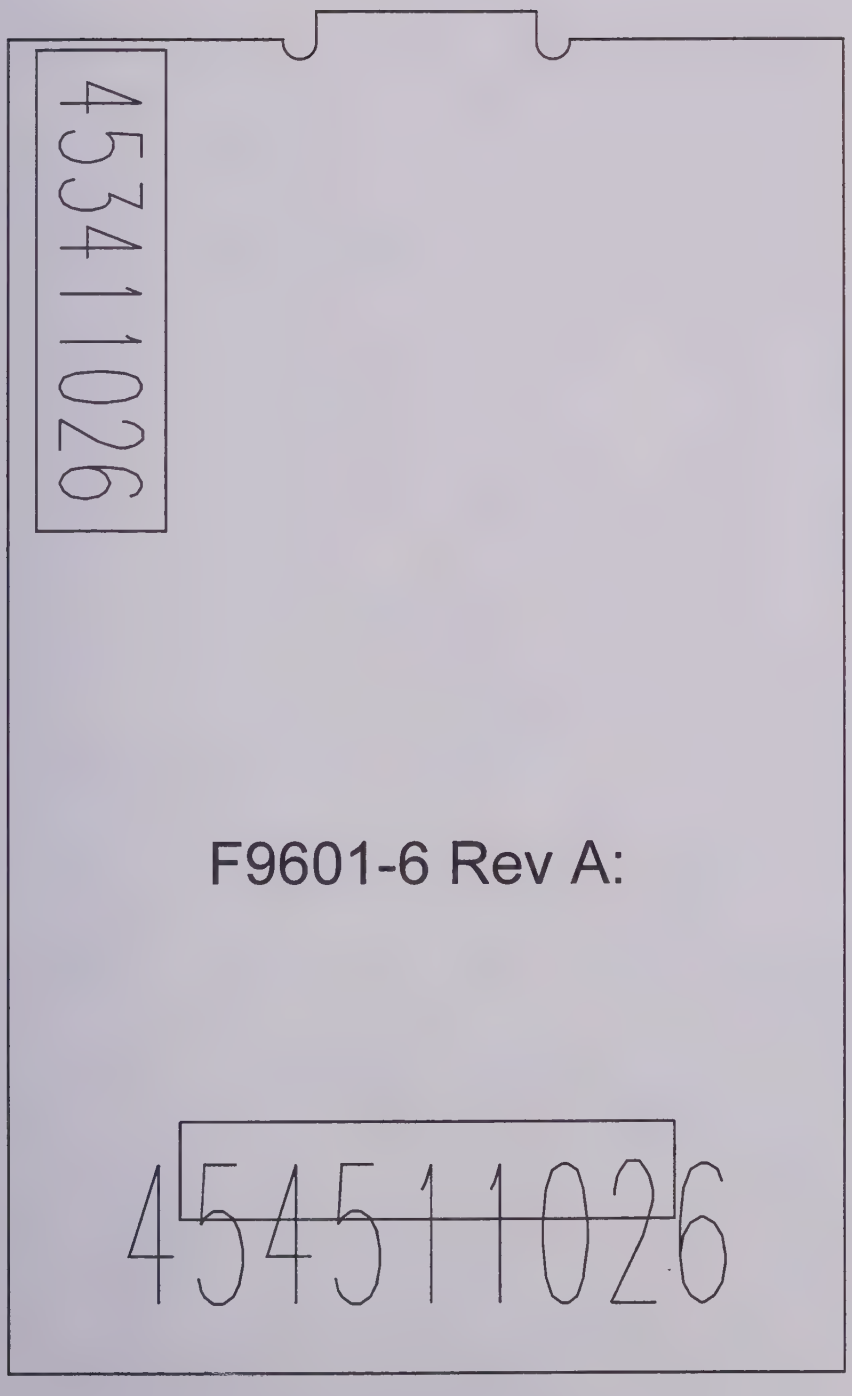
WITH THE UNDERSTANDING THAT IT IS NOT TO BE USED, DISCLOSED OR REPRODUCED IN ANY MANNER WITHOUT THE APPROVAL OF LECROY CORPORATION

	LeCroy S.A
DRAWN: SALAMIN-M	MODEL : 9601-6 FLOPPY ADAPTOR
CHKD: AMBUEHL-R	DWG NO Z-SCHEMA-9601 6
DATE: 25-MAR-96	SH 1 OF 1 REV A


F9601-6 Rev A: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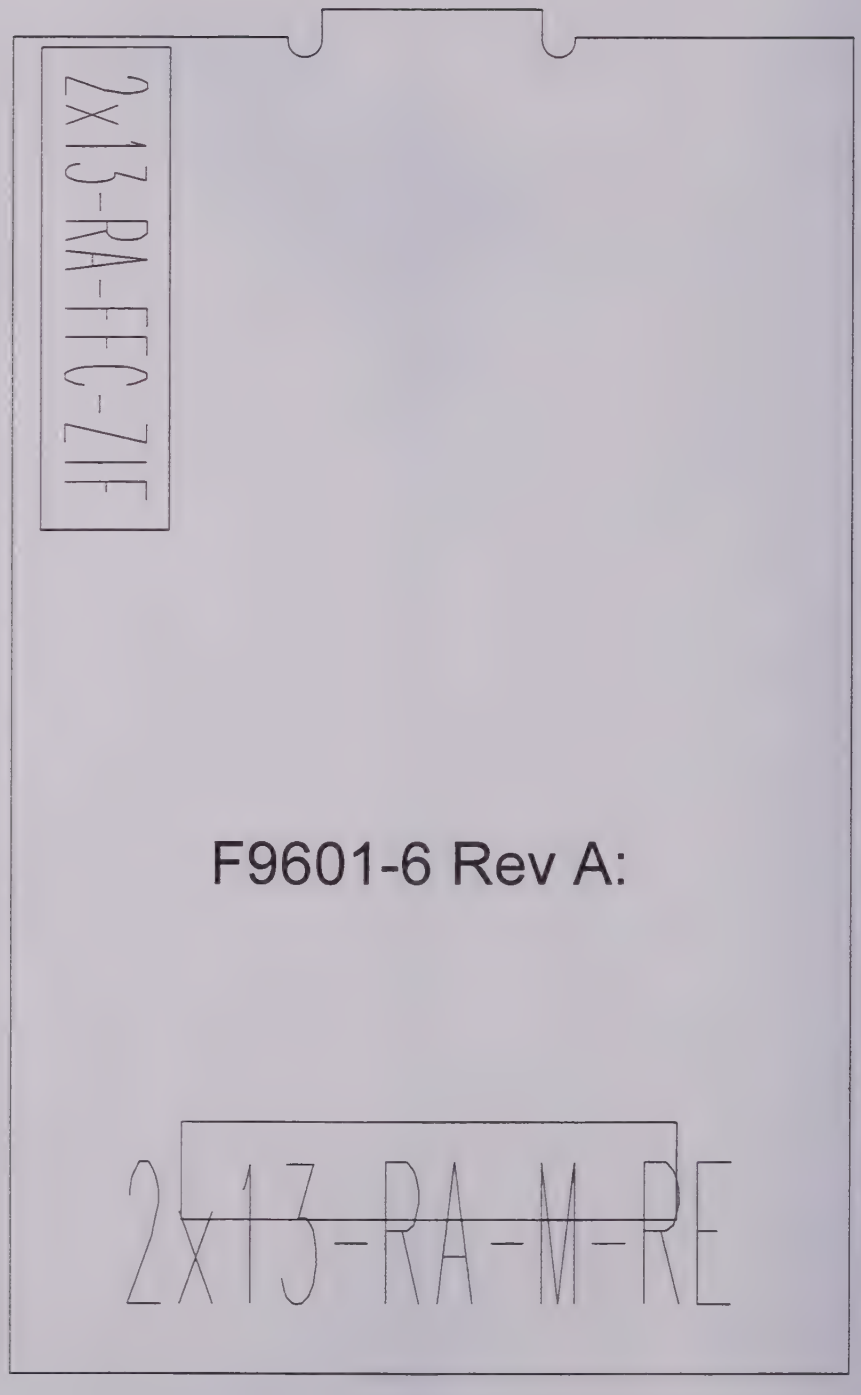
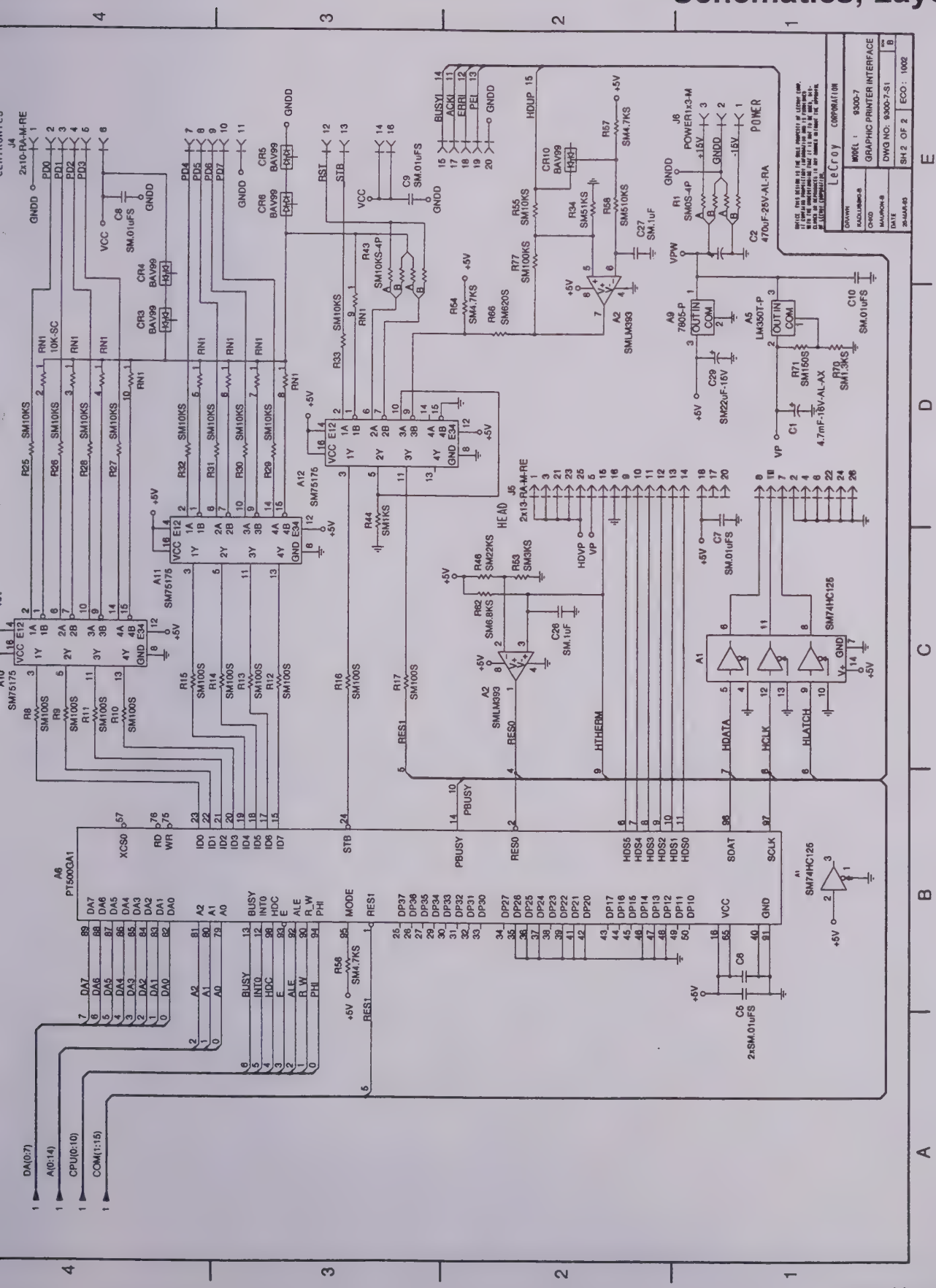
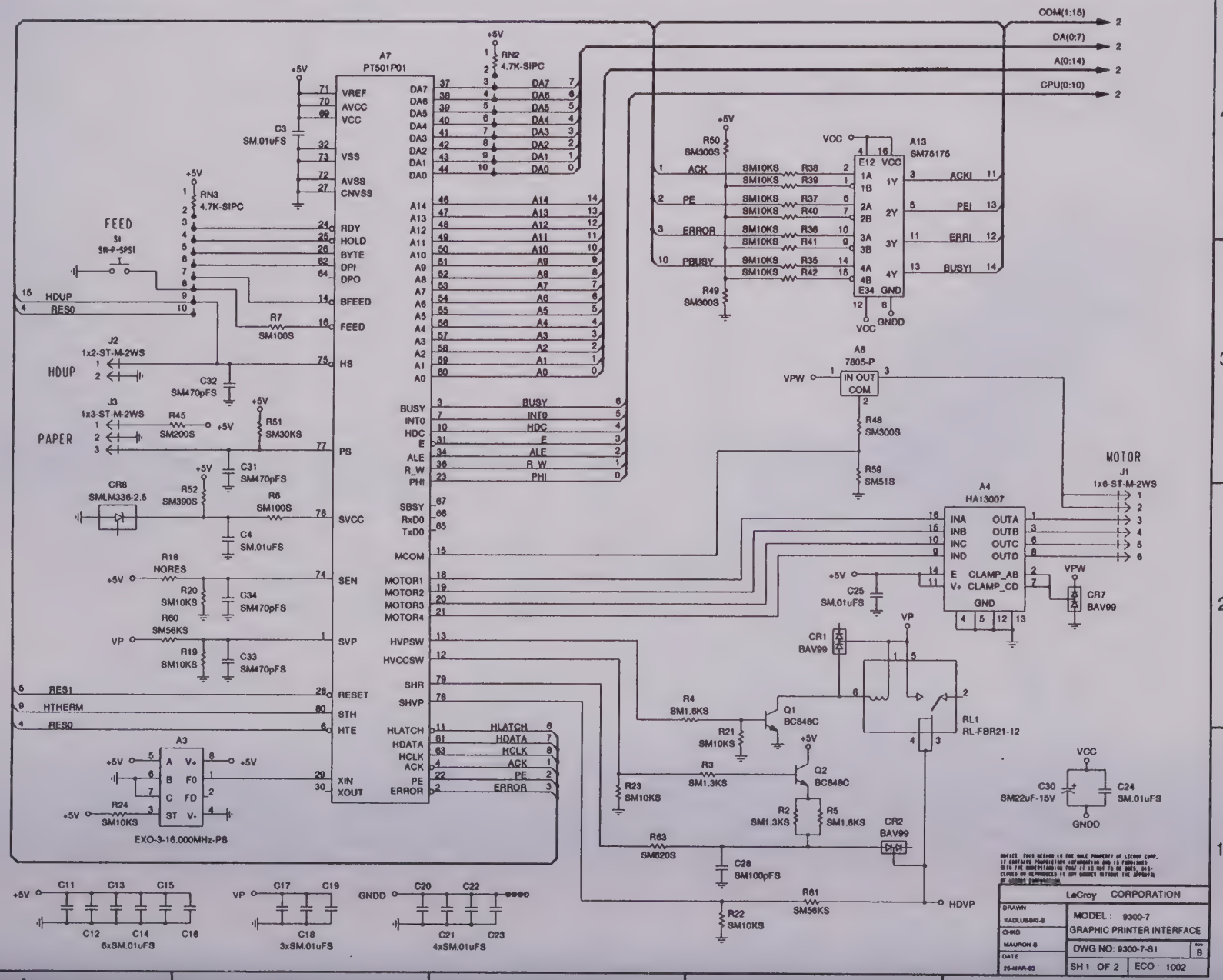
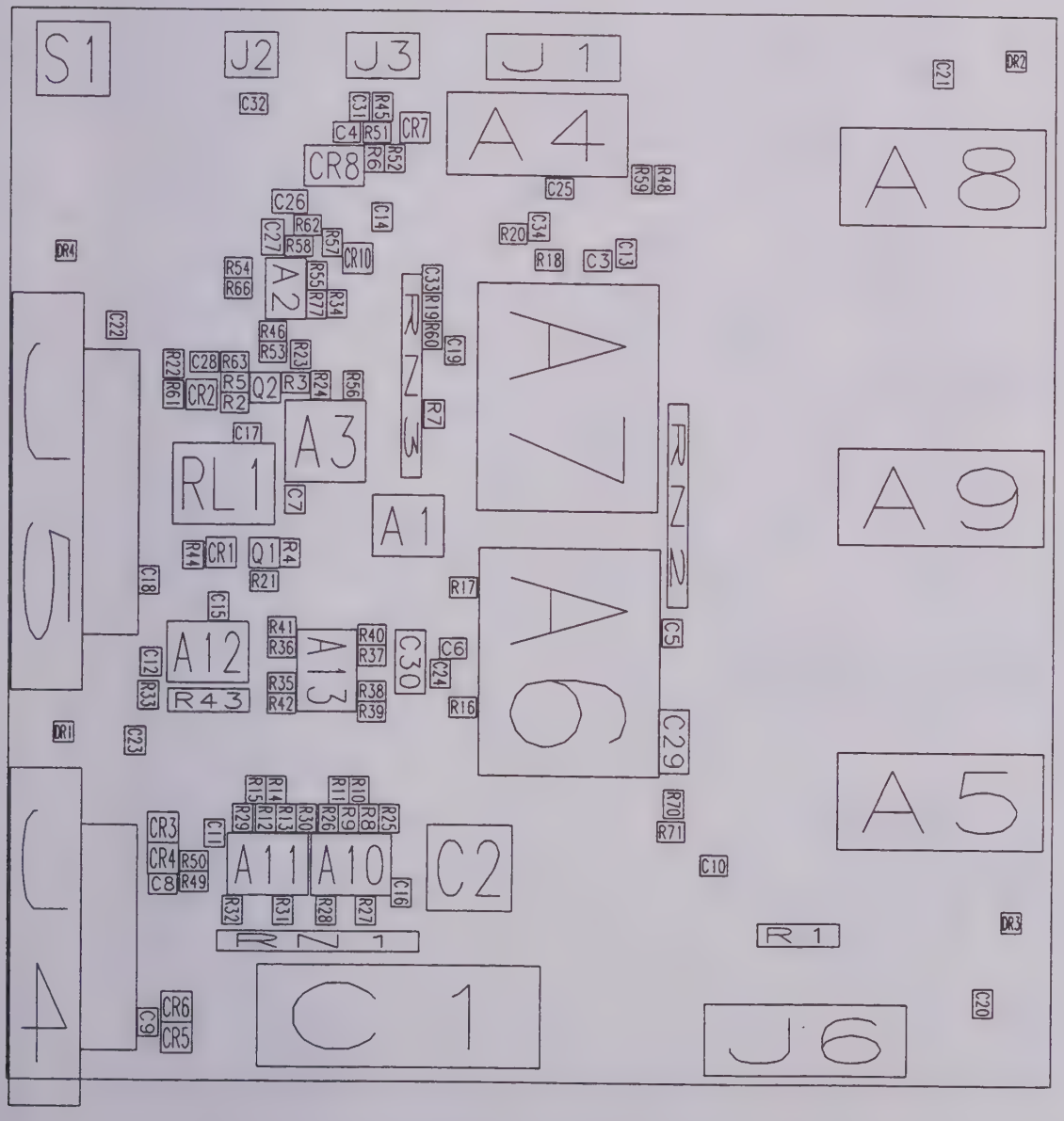
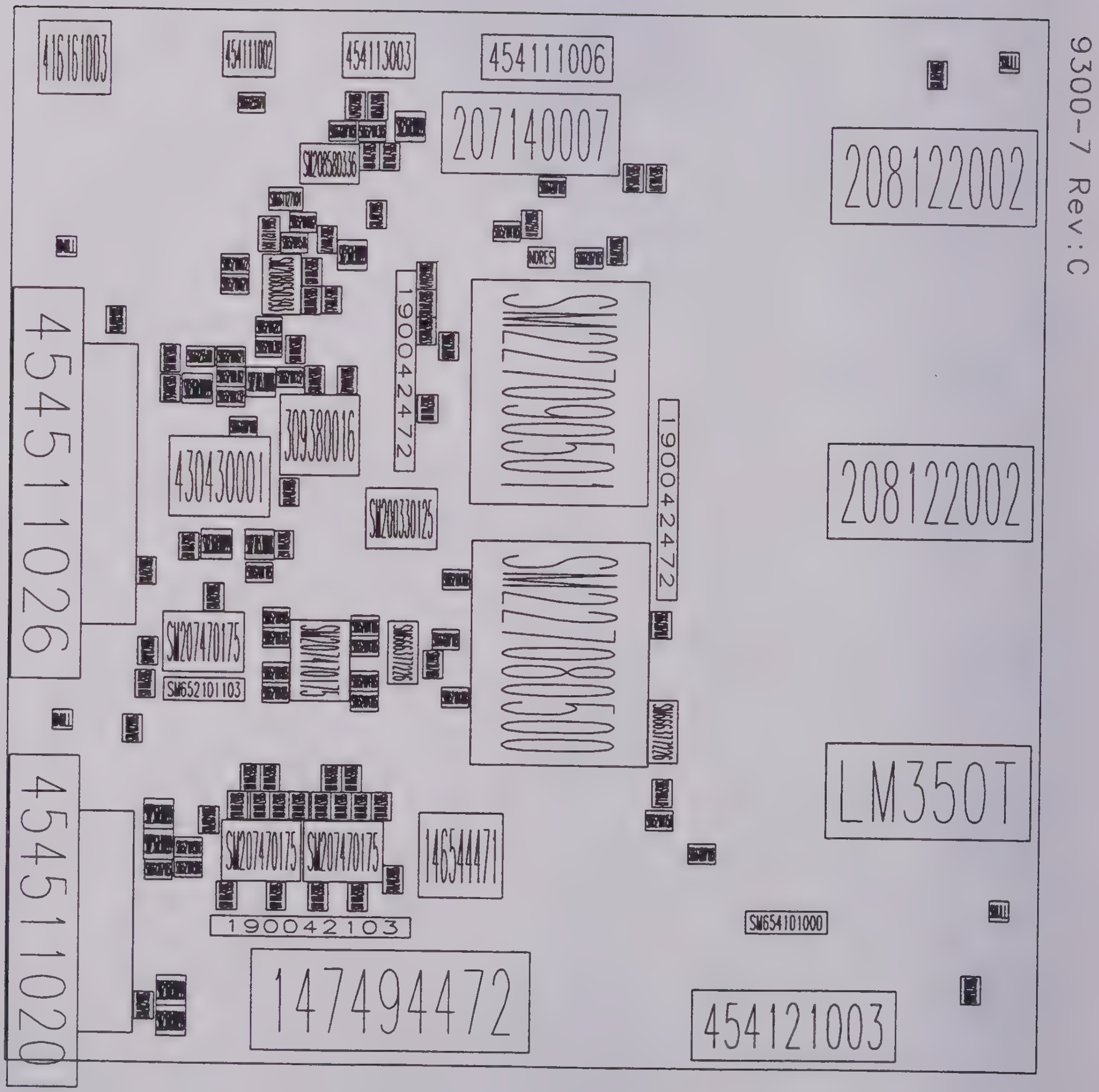
F9601-6 Rev A:
454511026


2x13-RA-FEC-ZIF
F9601-6 Rev A:
2x13-RA-M-RE


LeCroy CORPORATION
MODEL : 9300-7
GRAPHIC PRINTER INTERFACE
DWG NO: 9300-7-S1
SH 2 OF 2
ECO: 1002
DA(0:7)
A(0:14)
CPU(0:10)
COM(1:15)
A6 PT500GA1
A11 SM75175
A12 SM75175
A2 SMLM393
A1 SM74HC125
A9 7805-P
A5 LM350T-P
J4 2x10-RA-M-RE
J5 2x13-RA-M-RE
J6 POWER1x3-M
HEAD
POWER
HDUP
HTHERM
HDATA
HCLK
HLATCH
PBUSY
RES0
RES1
SDAT
SCLK
VCC
GND
GNDD
VPW
VP
HDVP
+5V


A7
PT501P01
VREF
AVCC
VCC
VSS
AVSS
CNVSS
RDY
HOLD
BYTE
DPI
DPO
BFEED
FEED
HS
PS
SVCC
SEN
RESET
STH
HTE
XIN
XOUT
SHR
SHVP
HVPSW
HVCCSW
MCOM
MOTOR1
MOTOR2
MOTOR3
MOTOR4
SBSY
RxD0
TxD0
BUSY
INT0
HDC
E
ALE
R_W
PHI
HLATCH
HDATA
HCLK
ACK
PE
ERROR
DA7
DA6
DA5
DA4
DA3
DA2
DA1
DA0
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
COM(1:15)
DA(0:7)
A(0:14)
CPU(0:10)
RN2
4.7K-SIPC
RN3
4.7K-SIPC
C3
SM.01uFS
FEED
SW-P-SPST
HDUP
RES0
RES1
HTHERM
R7
SM100S
J2
1x2-ST-M-2WS
C32
SM470pFS
J3
1x3-ST-M-2WS
PAPER
R45
SM200S
R51
SM30KS
C31
SM470pFS
CR8
SML-M336-2.5
R52
SM390S
R6
SM100S
C4
SM.01uFS
R18
NORES
R20
SM10KS
C34
SM470pFS
R60
SM56KS
R19
SM10KS
C33
SM470pFS
A3
R24
SM10KS
EXO-3-16.000MHz-PS
C11
C12
C13
C14
C15
C16
6xSM.01uFS
C17
C18
C19
3xSM.01uFS
C20
C21
C22
C23
4xSM.01uFS
R50
SM300S
R49
SM300S
SM10KS
R38
R39
R37
R40
R36
R41
R35
R42
ACK
PE
ERROR
PBUSY
A13
SM75175
ACKI
PEI
ERRI
BUSYI
A8
7805-P
VPW
R48
SM300S
R59
SM51S
A4
HA13007
MOTOR
J1
1x6-ST-M-2WS
C25
SM.01uFS
CLAMP_AB
CLAMP_CD
CR7
BAV99
CR1
BAV99
RL1
RL-FBR21-12
Q1
BC846C
Q2
BC846C
R4
SM1.6KS
R21
SM10KS
R3
SM1.3KS
R23
SM10KS
R2
SM1.3KS
R5
SM1.6KS
CR2
BAV99
R63
SM620S
C28
SM100pFS
R61
SM56KS
R22
SM10KS
HDVP
C30
SM22uF-15V
C24
SM.01uFS
VCC
GNDD
LeCroy CORPORATION
MODEL : 9300-7
GRAPHIC PRINTER INTERFACE
DWG NO: 9300-7-S1
B
SH 1 OF 2
ECO · 1002
DRAWN
KADLUBSKI-S
CHKD
MAURON-S
DATE
26-MAR-93


9300-7 Rev:C
S1
J2
J3
J1
A4
A8
A7
A9
A6
A5
A3
A1
A2
A12
A13
A11
A10
C2
C1
J6
J5
J4
RL1
RN1
RN2
RN3
R1
R43
C29
C30
CR8
CR7
CR10
CR1
CR2
CR3
CR4
CR5
CR6
Q1
Q2
R43
C32
C31
R45
C4
R51
R6
R52
C25
R59
R48
C26
C14
R62
C27
R58
R57
R20
C34
R18
C3
C13
DR4
R54
R66
R55
R77
R34
C33
R19
R60
C19
C22
R46
R53
R23
R22
C28
R63
R61
R5
R2
R3
R24
R56
R7
C17
C7
R44
R4
R21
C18
R17
C15
R41
R36
R40
R37
C6
C5
C12
R33
R35
R42
R38
R39
C24
R16
DR1
C23
R15
R14
R11
R10
R29
R12
R13
R30
R26
R9
R8
R25
R70
R71
C11
R50
R49
C8
C10
R32
R31
R28
R27
C16
DR3
C9
C20
C21
DR2


416161003
454111002
454113003
454111006
207140007
208122002
9300-7 Rev:C
SW208580336
454511026
309380016
430430001
SW208330125
SW227090501
190042472
190042472
208122002
SW227080500
SW207470175
SW207410175
SW652101103
SW665377226
SW665377226
LM350T
454511020
SW207470175
SW207470175
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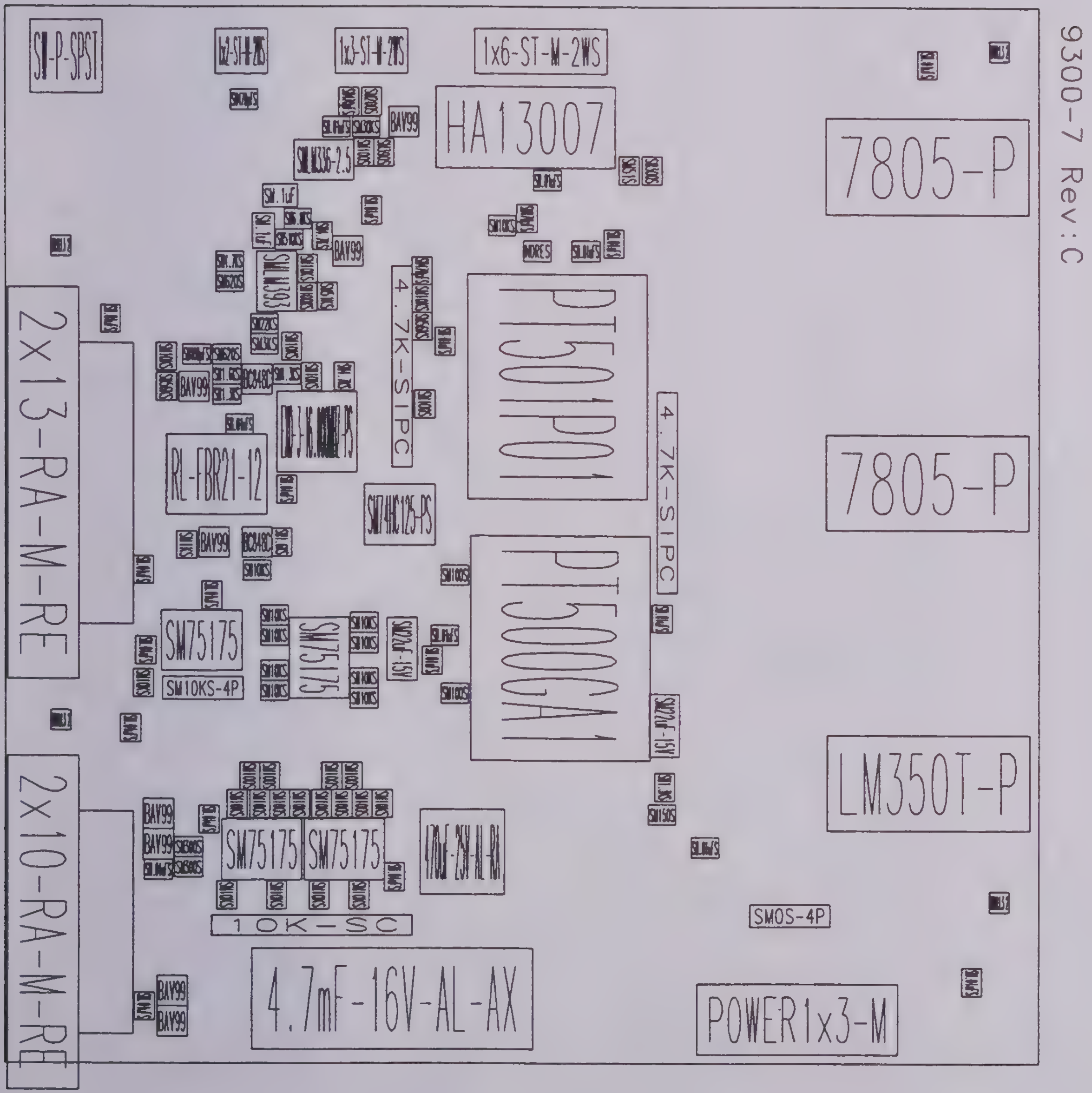
190042103
SW654101000
147494472
454121003


1x6-ST-M-2WS
HA13007
7805-P
7805-P
LM350T-P
9300-7 Rev:C
2x13-RA-M-RE
2x10-RA-M-RE
4.7K-SIPC
4.7K-SIPC
RL-FBR21-12
SM75175
SM10KS-4P
SM75175
SM75175
10K-SC
4.7mF-16V-AL-AX
SMOS-4P
POWER1x3-M

PART: F9300-7 **DESC : Printer Controller**

Location	Part Number	Description
A1	SM200330125	SM74HC125-PS
A2	SM208650393	SMLM393
A3	309380016	16.000MHZ
A4	207140007	HA13007
A5	208590350	LM350T-P
A6	SM227080500	PT500GA1
A7	SM227090501	PT502P01
A8	208122002	7805-P
A9	208122002	7805-P
A10	SM207470175	SM75175
A11	SM207470175	SM75175
A12	SM207470175	SM75175
A13	SM207470175	SM75175
C1	147494472	4.7mF-16V
C2	146544471	470uF-25V
C3	SM661207103	SM.01uFS
C4	SM661207103	SM.01uFS
C5	SM661207103	SM.01uFS
C6	SM661207103	SM.01uFS
C7	SM661207103	SM.01uFS
C8	SM661207103	SM.01uFS
C9	SM661207103	SM.01uFS
C10	SM661207103	SM.01uFS
C11	SM661207103	SM.01uFS
C12	SM661207103	SM.01uFS
C13	SM661207103	SM.01uFS
C14	SM661207103	SM.01uFS
C15	SM661207103	SM.01uFS
C16	SM661207103	SM.01uFS
C17	SM661207103	SM.01uFS
C18	SM661207103	SM.01uFS
C19	SM661207103	SM.01uFS
C20	SM661207103	SM.01uFS
C21	SM661207103	SM.01uFS
C22	SM661207103	SM.01uFS
C23	SM661207103	SM.01uFS
C24	SM661207103	SM.01uFS
C25	SM661207103	SM.01uFS
C26	SM661127104	SM.1uF
C27	SM661127104	SM.1uF
C28	SM661255101	SM100pFS
C29	SM666377226	SM22uF-15V
C30	SM666377226	SM22uF-15V

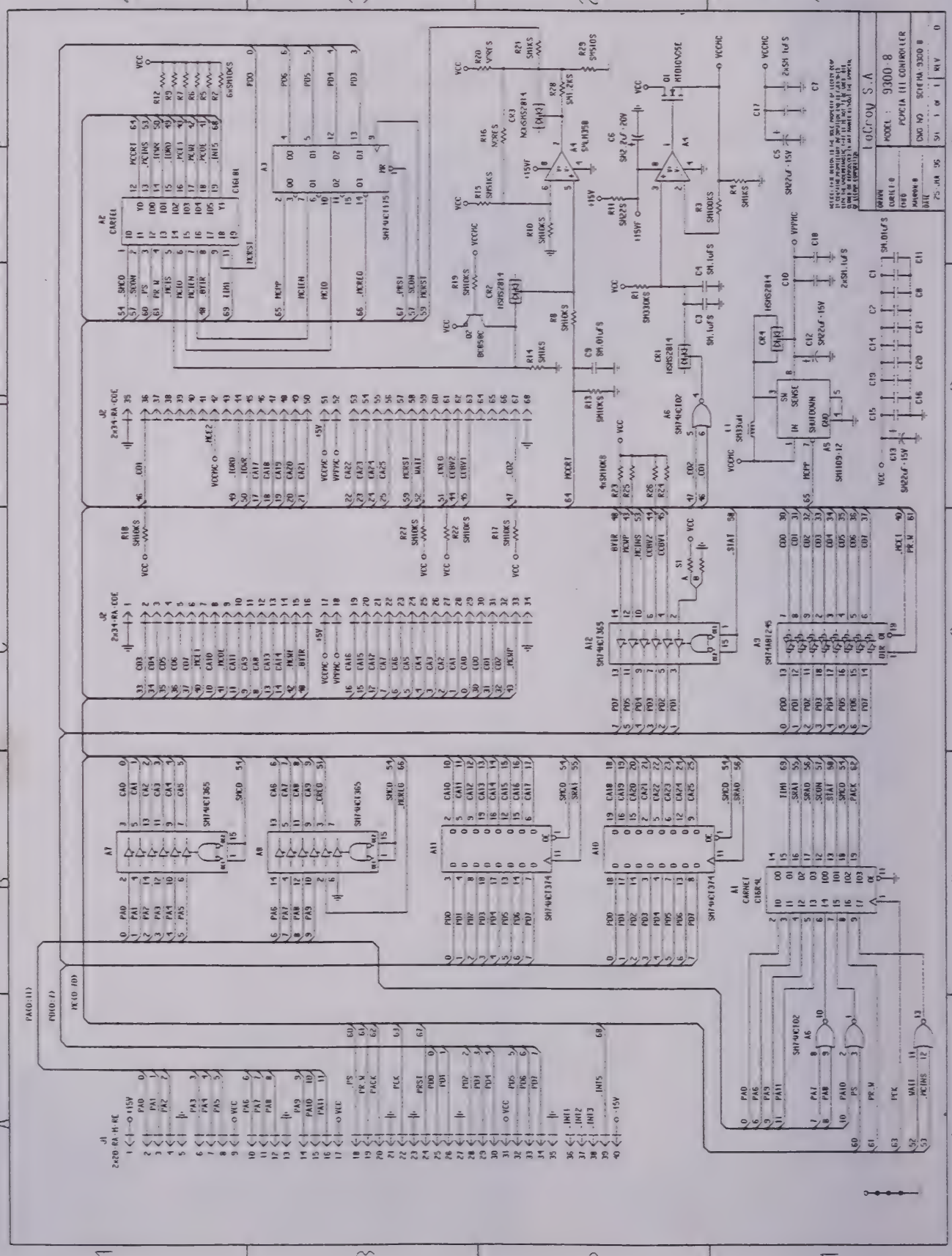
Location	Part Number	Description
C31	SM661255471	SM470pFS
C32	SM661255471	SM470pFS
C33	SM661255471	SM470pFS
C34	SM661255471	SM470pFS
CR1	SM236030099	BAV99
CR2	SM236030099	BAV99
CR3	SM236030099	BAV99
CR4	SM236030099	BAV99
CR5	SM236030099	BAV99
CR6	SM236030099	BAV99
CR7	SM236030099	BAV99
CR8	SM208580336	SMLM336-2.5
CR10	SM236030099	BAV99
J1	454111006	1x6-ST-M-2WS
J2	454111002	1x2-ST-M-2WS
J3	454113003	1x3-ST-M-2WS
J4	454511020	2x10-RA-M-RE
J5	454511026	2x13-RA-M-RE
J6	454121003	POWER1x3-M
J7	454115003	1x3-ST-M-FLPN
Q1	SM270330848	BC848C
Q2	SM270330848	BC848C
R1	SM654101000	SM0S-4P
R2	SM652101132	SM1.3KS
R3	SM652101132	SM1.3KS
R4	SM652101162	SM1.6KS
R5	SM652101162	SM1.6KS
R6	SM652101101	SM100S
R7	SM652101101	SM100S
R8	SM652101101	SM100S
R9	SM652101101	SM100S
R10	SM652101101	SM100S
R11	SM652101101	SM100S
R12	SM652101101	SM100S
R13	SM652101101	SM100S
R14	SM652101101	SM100S
R15	SM652101101	SM100S
R16	SM652101101	SM100S
R17	SM652101101	SM100S
R19	SM652101103	SM10KS
R20	SM652101103	SM10KS
R21	SM652101103	SM10KS

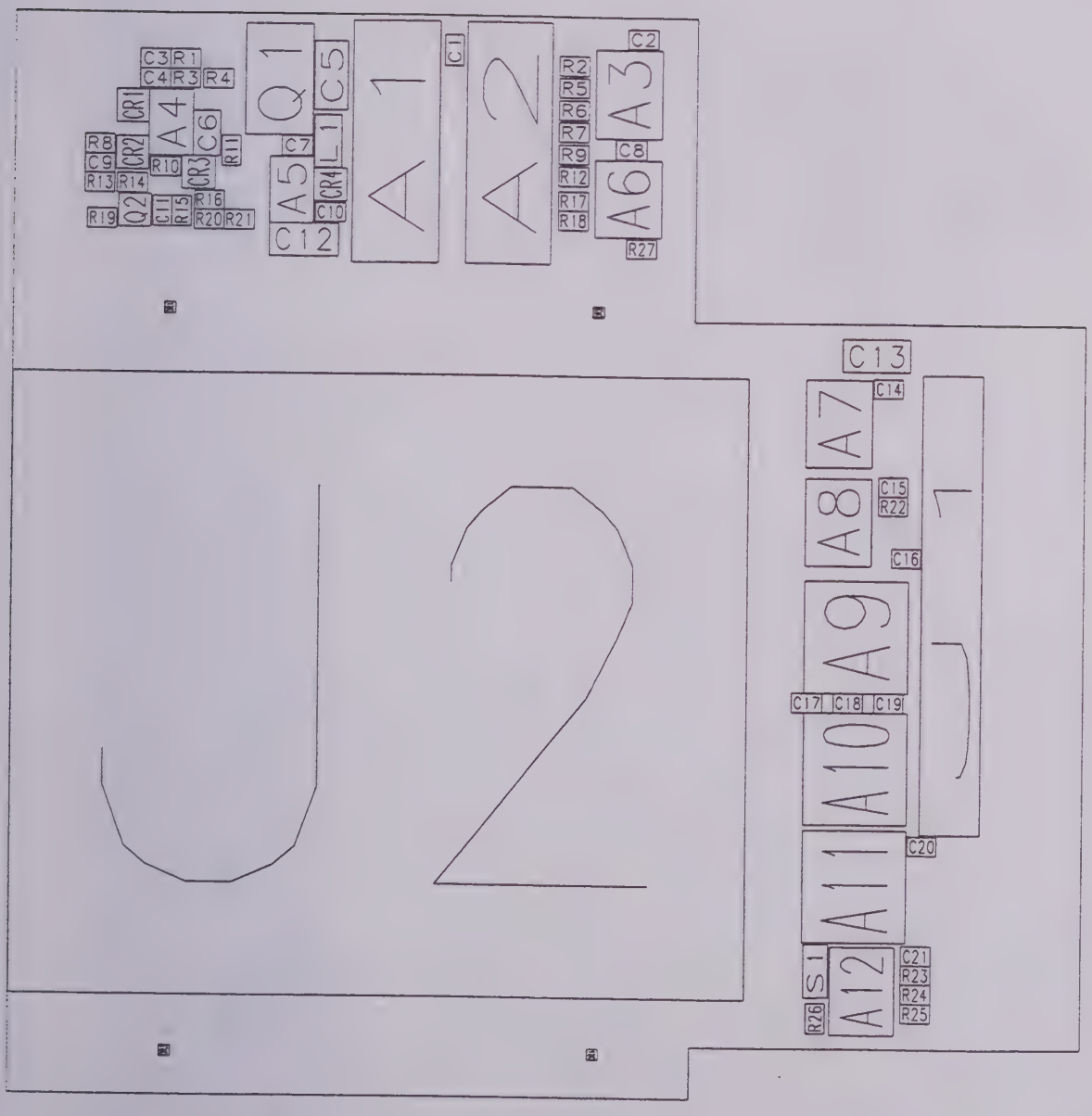
PART: F9300-7 **DESC : Printer Controller**

Location	Part Number	Description	Location	Part Number	Description
R22	SM652101103	SM10KS	R49	SM652101301	SM300S
R23	SM652101103	SM10KS	R50	SM652101301	SM300S
R24	SM652101103	SM10KS	R51	SM652101303	SM30KS
R25	SM652101103	SM10KS	R52	SM652101391	SM390S
R26	SM652101103	SM10KS	R53	SM652101302	SM3KS
R27	SM652101103	SM10KS	R54	SM652101472	SM4.7KS
R28	SM652101103	SM10KS	R55	SM652101103	SM10KS
R29	SM652101103	SM10KS	R56	SM652101472	SM4.7KS
R30	SM652101103	SM10KS	R57	SM652101472	SM4.7KS
R31	SM652101103	SM10KS	R58	SM652101514	SM510KS
R32	SM652101103	SM10KS	R59	SM652101510	SM51S
R33	SM652101103	SM10KS	R60	SM652101563	SM56KS
R34	SM652101513	SM51KS	R61	SM652101563	SM56KS
R35	SM652101103	SM10KS	R62	SM652101682	SM6.8KS
R36	SM652101103	SM10KS	R63	SM652101621	SM620S
R37	SM652101103	SM10KS	R66	SM652101621	SM620S
R38	SM652101103	SM10KS	R67	SM652101472	SM4.7KS
R39	SM652101103	SM10KS	R70	SM652101132	SM1.3KS
R40	SM652101103	SM10KS	R71	SM652101151	SM150S
R41	SM652101103	SM10KS	R77	SM652101104	SM100KS
R42	SM652101103	SM10KS	RL1	430430001	RL-FBR21-12
R43	SM652101103	SM10KS	RN1	190042103	10K-SC
R44	SM652101102	SM1KS	RN2	190042472	4.7K-SIPC
R45	SM652101201	SM200S	RN3	190042472	4.7K-SIPC
R46	SM652101223	SM22KS	S1	416161003	SW-P-SPST
R48	SM652101301	SM300S			

PART: F9601-6 **DESC : Floppy Disk Interface**

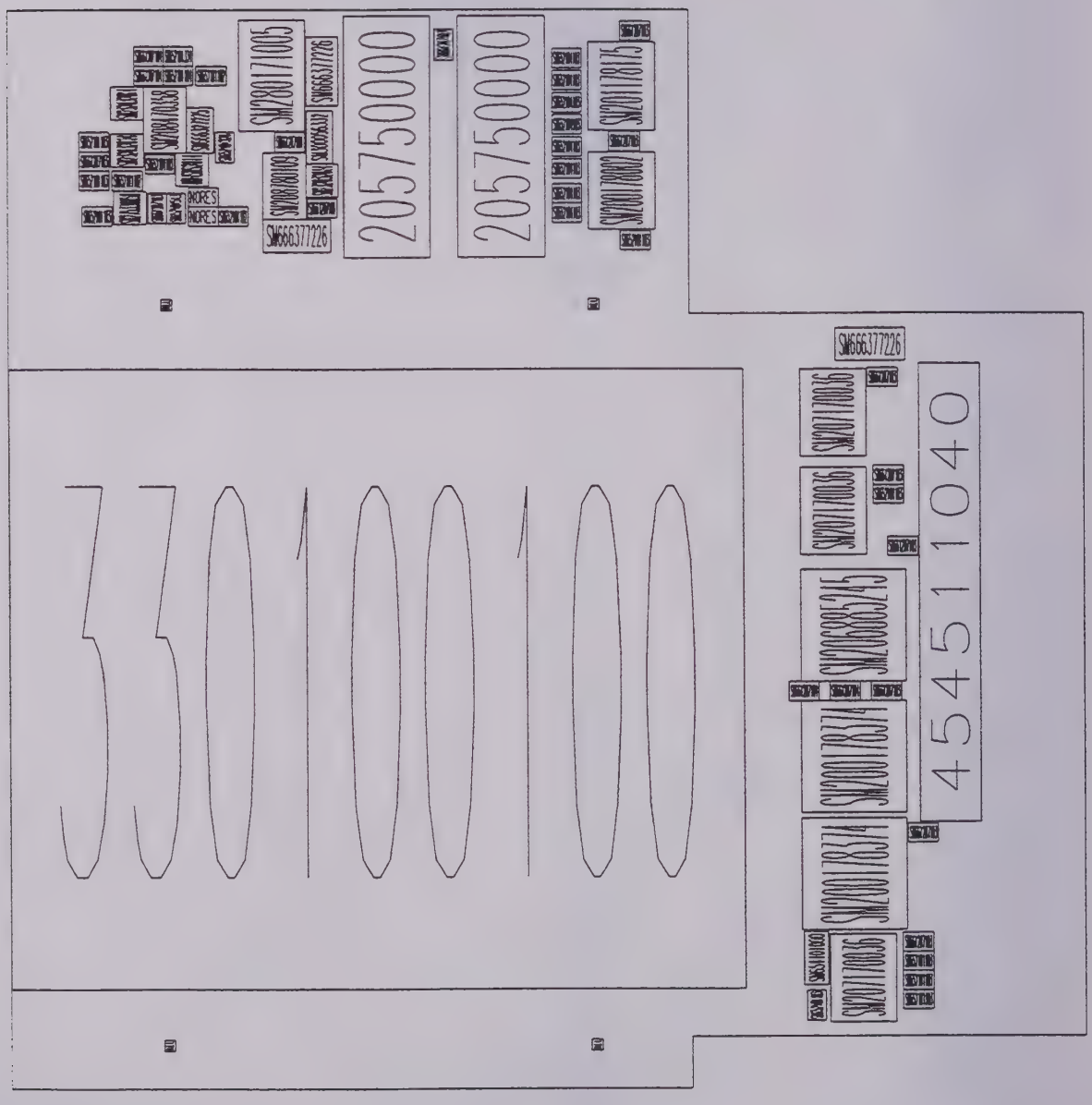
Location	Part Number	Description
J1	454511026	2x13-RA-M-RE
J2	453411026	2x13-RA-FFC-ZIF



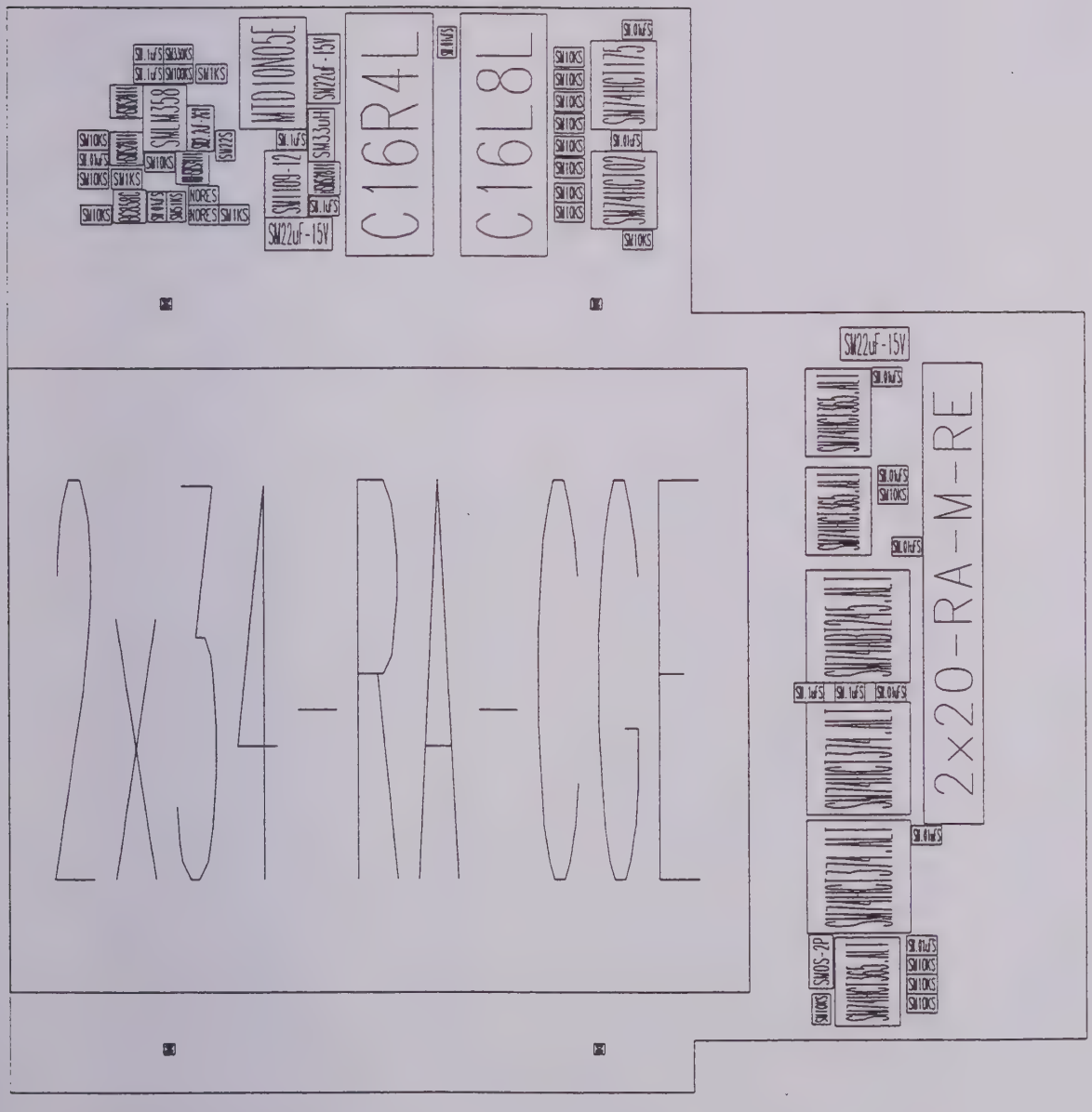

C3
R1
C4
R3
R4
CR1
A4
C6
R8
CR2
C9
R10
CR3
R11
R13
R14
Q2
C11
R15
R16
R19
R20
R21
Q1
C5
C7
A5
L1
CR4
C10
C12
A1
C1
A2
R2
R5
R6
R7
R9
R12
R17
R18
A3
C2
C8
A6
R27
C13
A7
C14
A8
C15
R22
C16
A9
C17
C18
C19
A10
A11
C20
S1
A12
C21
R23
R24
R25
R26
J1
J2

9300-8 Rev:B

Schematics, Layouts



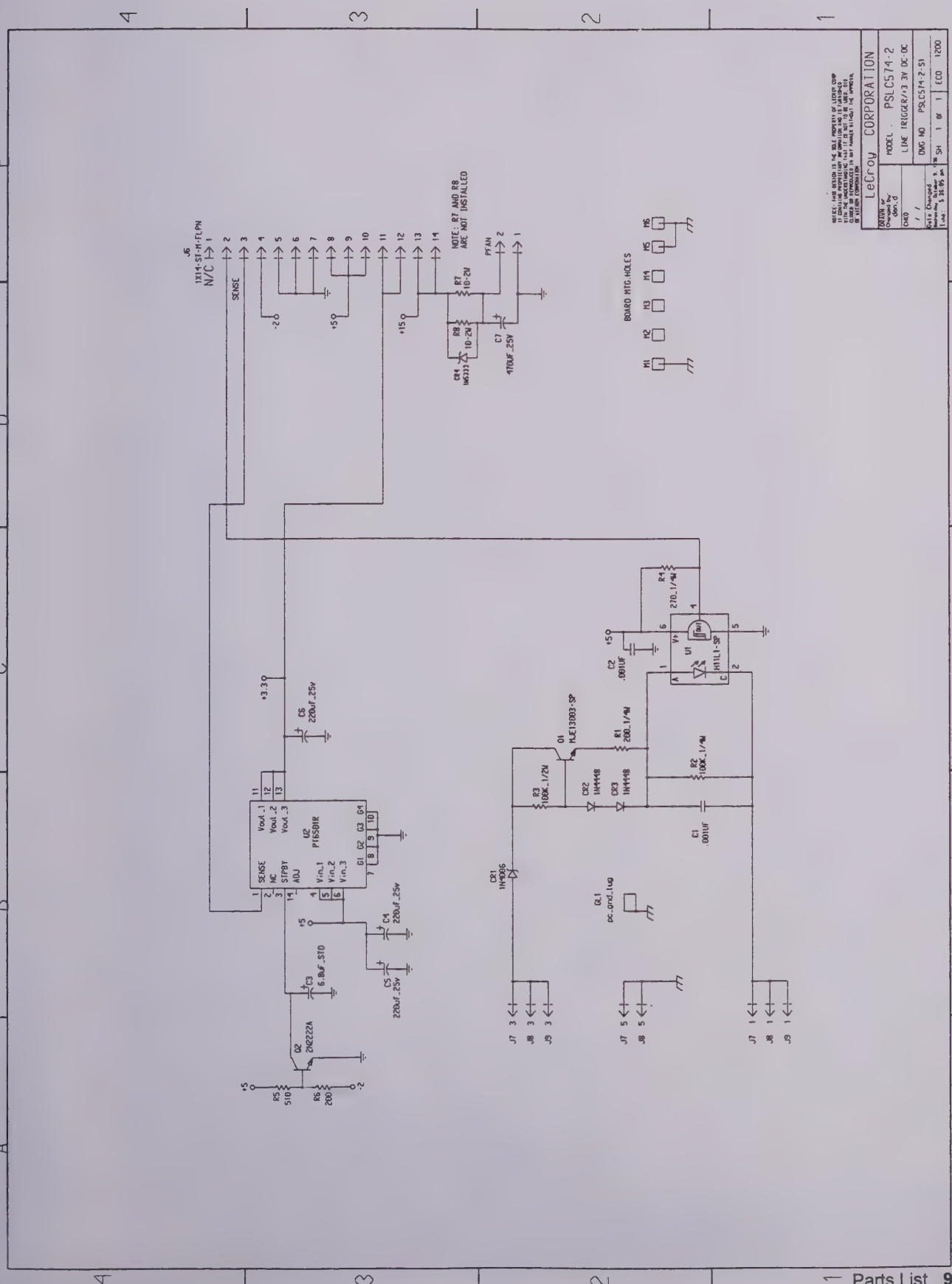
9300-8 Rev:B



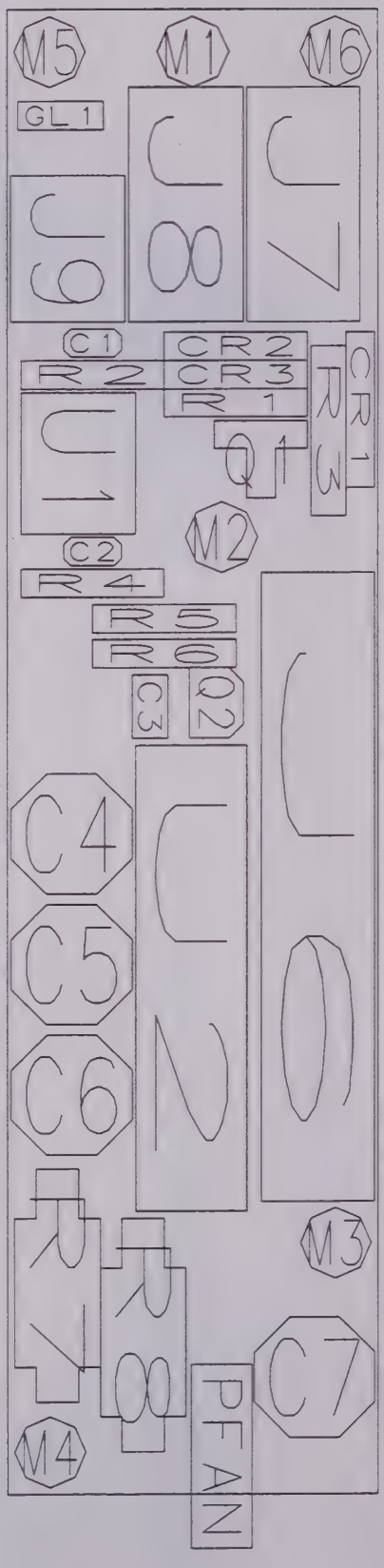
9300-8 Rev:B

PART: F9300-8 **DESC : Hard Disk Interface**

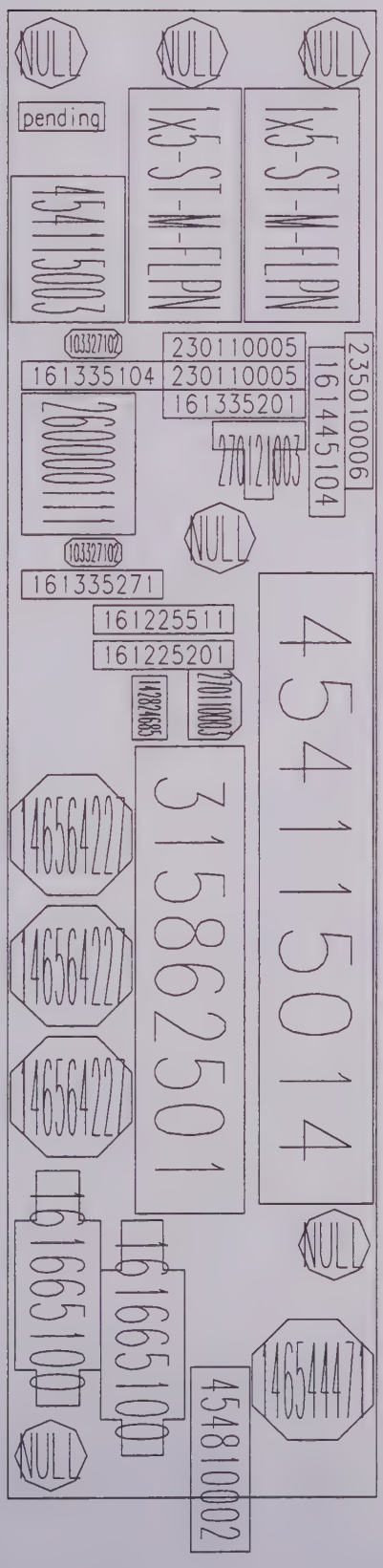
Location	Part Number	Description	Location	Part Number	Description
A1	205750000	C16R4L	CR2	SM232032814	HSMS2814
A2	205750000	C16L8L	CR4	SM232032814	HSMS2814
A3	SM201178175	SM74HCT175	J1	454511040	2x20-RA-M-RE
A4	SM208470358	SMLM358	J2	330100100	2x34-RA-CGE
A5	SM208780109	SM1109-12	L1	SM300056332	SM33uH
A6	SM200178002	SM74HCT02	Q1	SM280171005	MTD10N05E
A7	SM207170036	SM74HCT365	Q2	SM275330858	BC858C
A8	SM207170036	SM74HCT365	R1	SM652101334	SM330KS
A9	SM206885245	SM74ABT245	R2	SM652101103	SM10KS
A10	SM200178374	SM74HCT374	R3	SM652101104	SM100KS
A11	SM200178374	SM74HCT374	R4	SM652101102	SM1KS
A12	SM207170036	SM74HCT365	R5	SM652101103	SM10KS
C1	SM661207103	SM.01uFS	R6	SM652101103	SM10KS
C2	SM661207103	SM.01uFS	R7	SM652101103	SM10KS
C3	SM661207104	SM.1uFS	R8	SM652101103	SM10KS
C4	SM661207104	SM.1uFS	R9	SM652101103	SM10KS
C5	SM666377226	SM22uF-15V	R10	SM652101103	SM10KS
C6	SM666327225	SM2.2uF-20V	R11	SM652101220	SM22S
C7	SM661207104	SM.1uFS	R12	SM652101103	SM10KS
C8	SM661207103	SM.01uFS	R13	SM652101103	SM10KS
C9	SM661207103	SM.01uFS	R14	SM652101102	SM1KS
C10	SM661207104	SM.1uFS	R15	SM652101513	SM51KS
C11	SM661207103	SM.01uFS	R17	SM652101103	SM10KS
C12	SM666377226	SM22uF-15V	R18	SM652101103	SM10KS
C13	SM666377226	SM22uF-15V	R19	SM652101103	SM10KS
C14	SM661207103	SM.01uFS	R21	SM652101102	SM1KS
C15	SM661207103	SM.01uFS	R22	SM652101103	SM10KS
C16	SM661207103	SM.01uFS	R23	SM652101103	SM10KS
C17	SM661207104	SM.1uFS	R24	SM652101103	SM10KS
C18	SM661207104	SM.1uFS	R25	SM652101103	SM10KS
C19	SM661207103	SM.01uFS	R26	SM652101103	SM10KS
C20	SM661207103	SM.01uFS	R27	SM652101103	SM10KS
C21	SM661207103	SM.01uFS	R28	SM652101122	SM1.2KS
CR1	SM232032814	HSMS2814	R29	SM652101511	SM510S
			S1	SM654101000	SM0S-2P


LeCroy CORPORATION
MODEL PSLC574-2
LINE TRIGGER/+3.3V DC-DC
DWG NO PSLC574-2-S1
SH 1 OF 1
ECO 1200
J6
1X14-ST-M-FLPN
N/C
SENSE
NOTE: R7 AND R8 ARE NOT INSTALLED
PFAN
R7 10-2W
R8 10-2W
CR4 1N5333
C7 470UF_25V
BOARD MTG.HOLES
M1
M2
M3
M4
M5
M6
R4 270_1/4W
C2 .001UF
U1 H11L1-SP
Q1 MJE13003-SP
R1 200_1/4W
R2 100K_1/4W
R3 100K_1/2W
CR2 1N4448
CR3 1N4448
C1 .001UF
CR1 1N4006
GL1 pc_gnd_lug
C6 220uF_25v
U2 PT6501R
SENSE
NC
STPBY
ADJ
Vout_1
Vout_2
Vout_3
Vin_1
Vin_2
Vin_3
C4 220uF_25v
C5 220uF_25v
C3 6.8uF_STD
Q2 2N2222A
R5 510
R6 200
J7
J8
J9

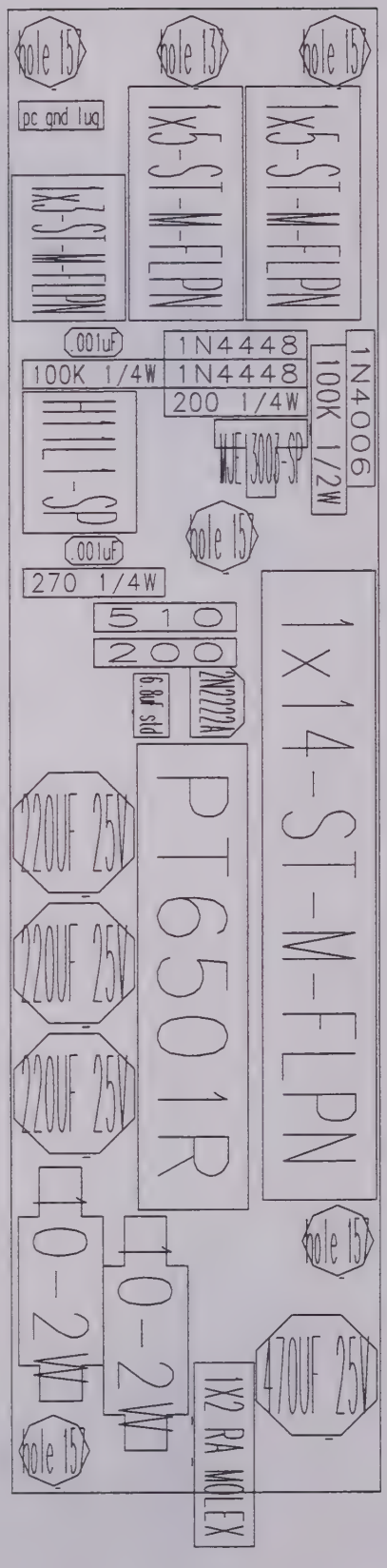
PSLC574-2 Rev A:



PSLC574-2 Rev A:

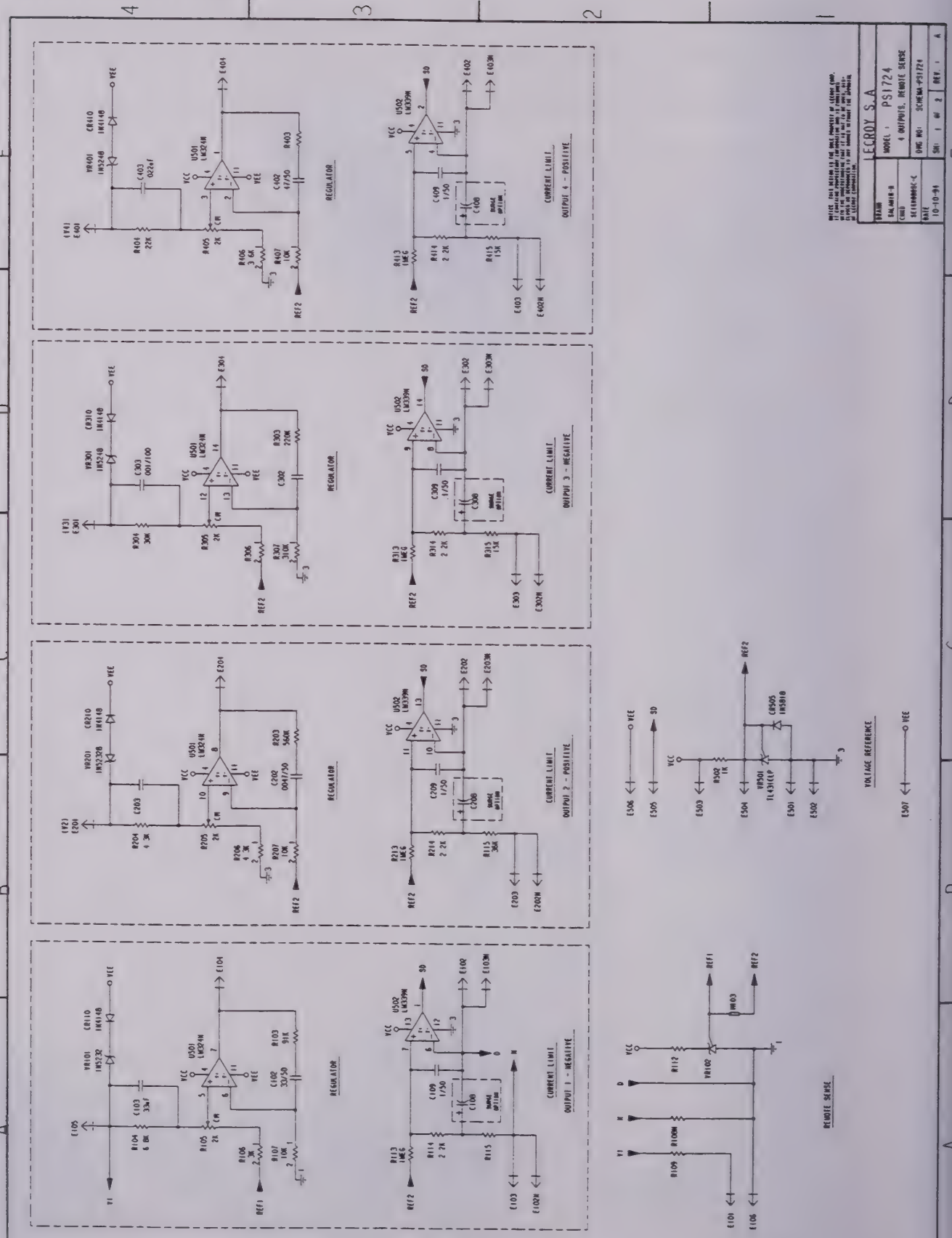


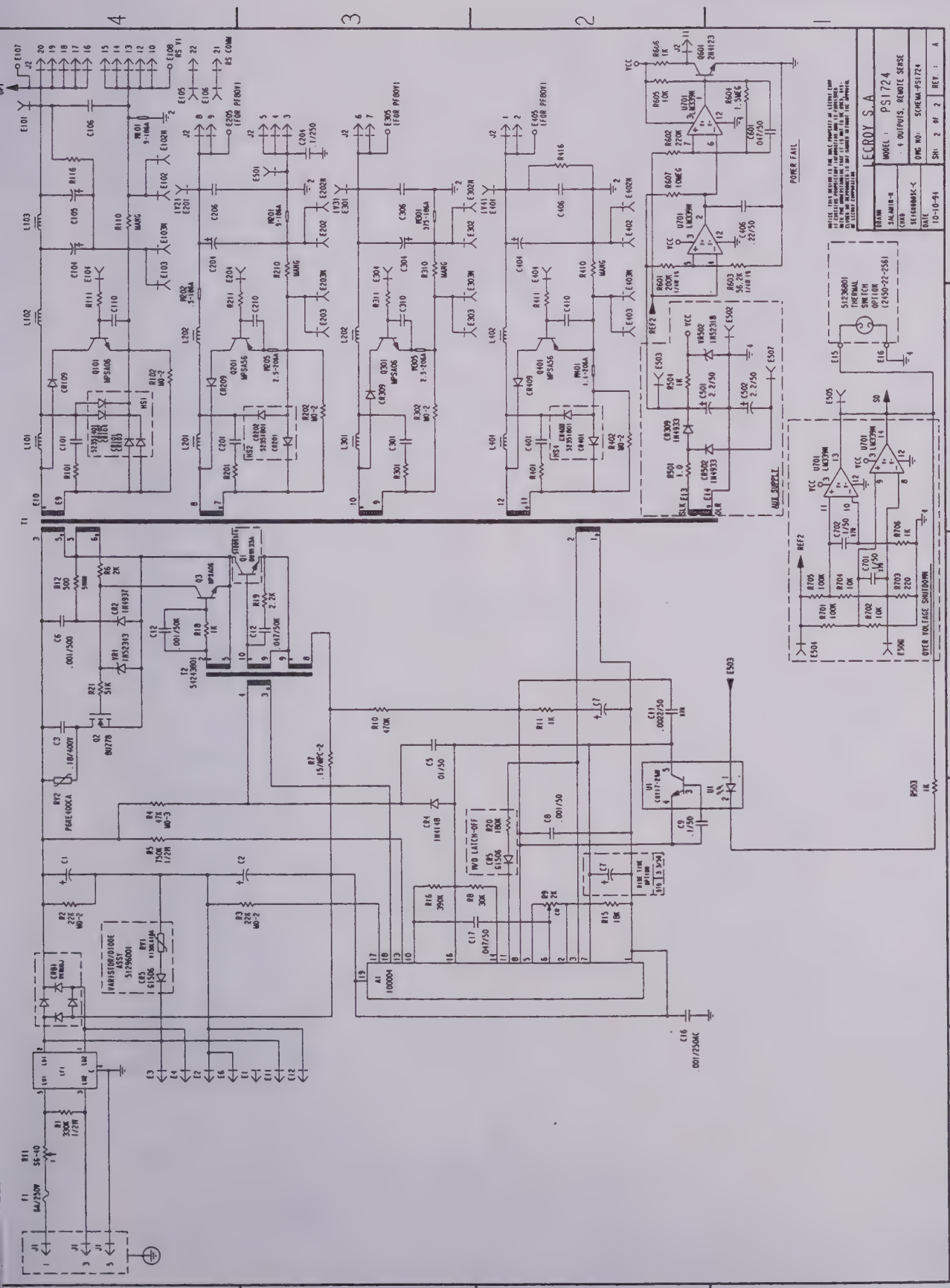
PSLC574-2 Rev A:



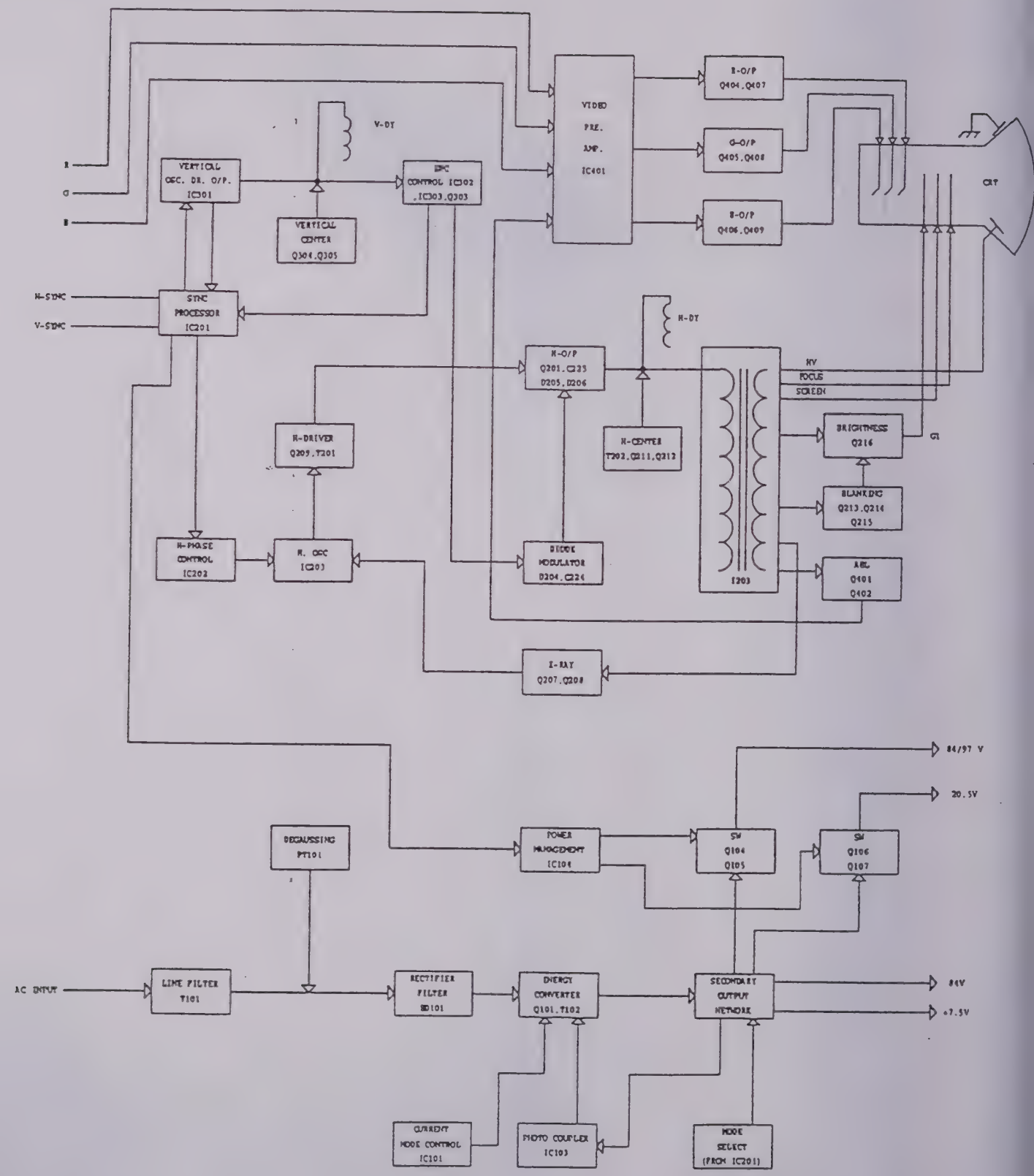
PART: PSLC574-2 **DESC : Hard Disk Interface**

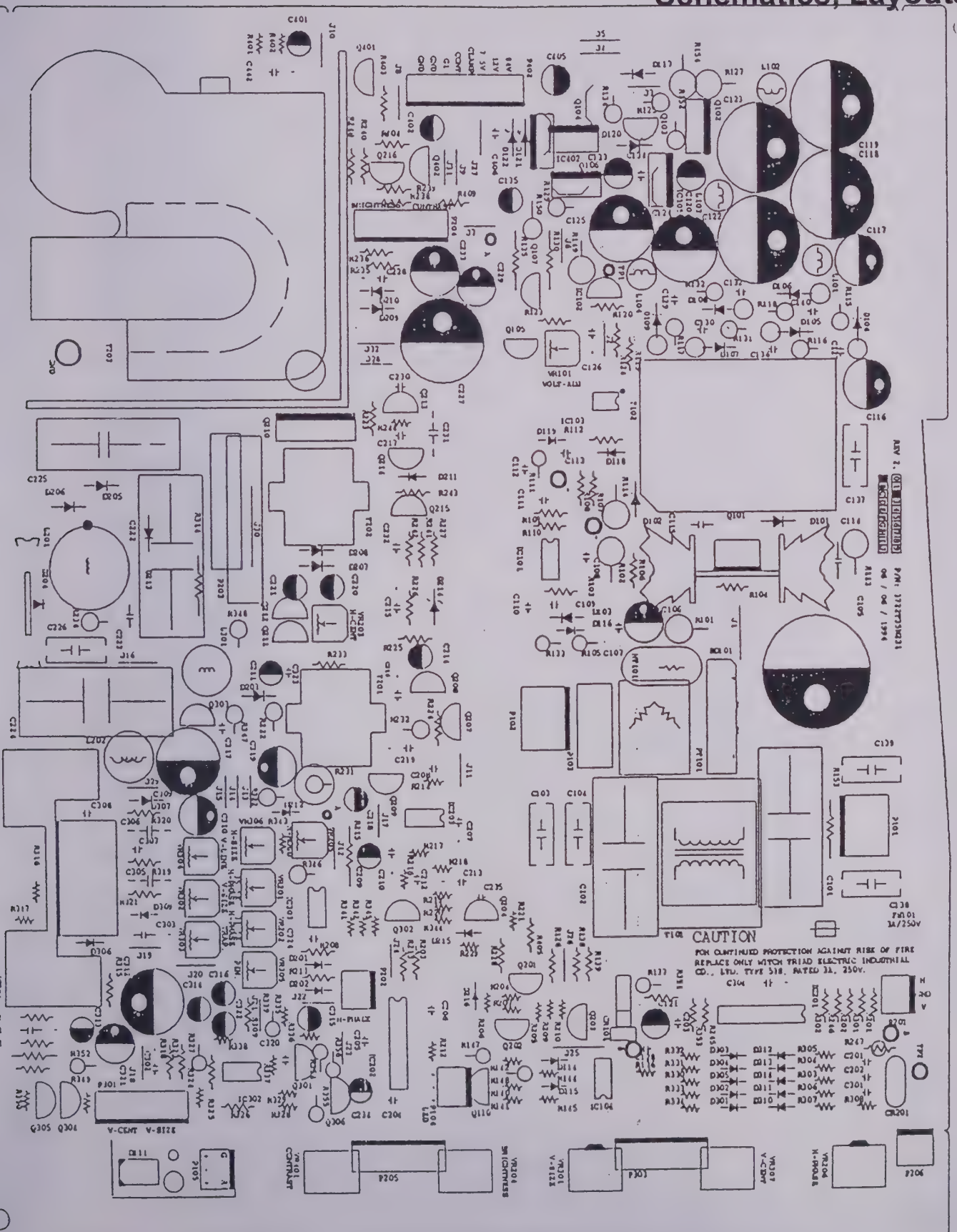
Location	Part Number	Description
C1	106435102	.001UF
C2	106435102	.001UF
C3	142824685	6.8 UF
C4	146564227	220 UF
C5	146564227	220 UF
C6	146564227	220 UF
C7	146544471	470 UF
CR1	235010006	1N4006
CR2	230110005	1N4448
CR3	230110005	1N4448
CR4	240035333	1N5333A
GL1	510140002	AMP 63525-1
J6	454115014	41671 26-48-1145
J7	454115103	41671 26-48-1055
J8	454115103	41671 26-48-1055
J9	454115003	41671 26-48-1035
PFAN	454810002	7395 22-05-7028
Q1	270121003	MJE13003
Q2	270110003	PN2222A
R1	161335201	200 OHM
R2	161335104	100 K
R3	161445104	100 K
R4	161335271	270 OHMS
R5	161225511	510 OHMS
R6	161225201	200 OHMS
U1	260000111	H11L1
	315826501	PT6501N
	455021008	02-06-1103
	455123002	02-06-1103
	590001022	7/30 BLK 22
	590221022	7/30 RED 22

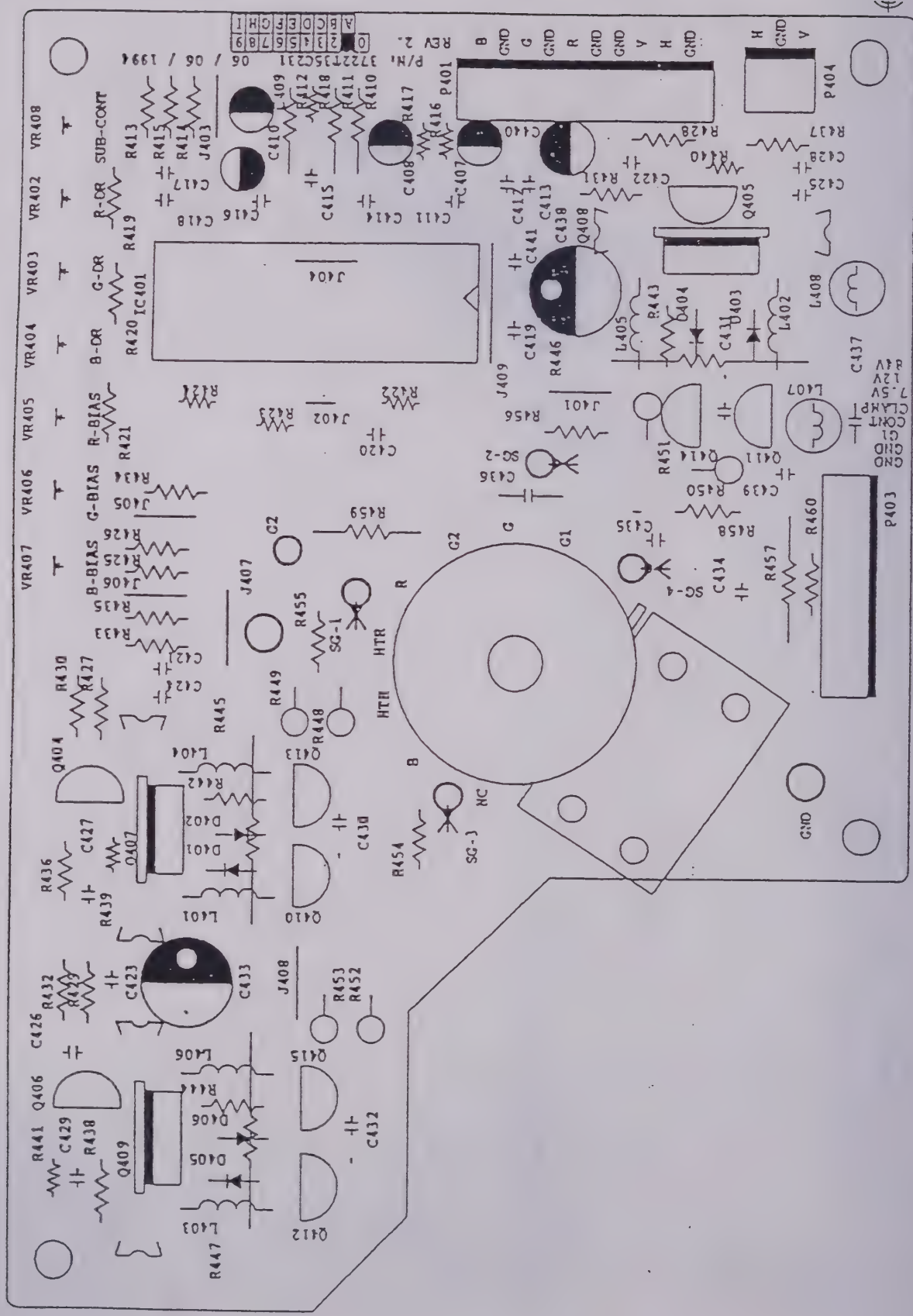

LECROY S.A
MODEL : PS1724
4 OUTPUTS, REMOTE SENSE
SCHEMA-PS1724
10-10-94
REGULATOR
CURRENT LIMIT
OUTPUT 1 - NEGATIVE
OUTPUT 2 - POSITIVE
OUTPUT 3 - NEGATIVE
OUTPUT 4 - POSITIVE
VOLTAGE REFERENCE
REMOTE SENSE


LECROY S.A
MODEL : PS1724
4 OUTPUTS, REMOTE SENSE
DWG NO: SCHEMA-PS1724
SH: 2 OF 2
REV : A
DATE 10-10-94
POWER FAIL
AUX SUPPLY
OVER VOLTAGE SHUTDOWN
VARISTOR/DIODE ASSY 51296001
W/O LATCH-OFF
DISC TIME OPTION
51236001 THERMAL SWITCH OPTION (2450-22-2561)

Schematics, Layouts




CAUTION
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE
REPLACE ONLY WITCH TRIAD ELECTRIC INDUSTRIAL
CO., LTD. TYPE 518, RATED 3A, 250V.



CD-1035E, EM Video Board

PART: CD9600 DESC : Color Display CRT Samsung M23LCD32X02

Main Board Sync Processing Circuit

IC201	WT8041	D311	1N4148
D301	1N4148	D312	1N4148
D302	1N4148	D313	1N4148
D303	1N4148	D314	1N4148
D304	1N4148		
D305	1N4148		
D310	1N4148		

Main Board Horizontal Deflection Circuit

IC202	74LS123	D205	FR306
IC203	MC1391P	D206	FR306
IC302	LM358	D207	FR104
IC303	LM393	D208	FR104
Q201	2SC945/1815	D215	1N4148
Q202	2SA733/1015	D216	1N4148
Q203	2SA733/1015	C213	2200P, 50V
Q204	2SC945/1815	C222	1.8μ 250V
Q209	2SC1213A	C225	5100P, 1.6KV
Q210	2SC5129	C226	3900P, 400V
Q211	2SC2236	T201	EI-19 34501901239
Q212	2SA966	T202	EI-19 34501902146
Q301	2SC945/1815	T203	FBT 34710100952
Q302	2SC945/1815	L201	8.7μH, 36080106330
D201	1N4148	L202	300μH, 36080111431
D202	1N4148	L301	1.4Mh, 36080105732
D203	FR104		
D204	HER305/306		

Main Board High Voltage Circuit

Q207	2SA733/1015	D217	1N4148
Q208	2SC945/1815		
Q213	2SC945/1815		
Q214	2SC945/1815		
Q215	2SC945/1815		
Q216	BF421/423		
Q401	2SA733/1015		
Q402	2SC945/1815		
D209	FR104		
D210	FR104		
D211	1N4148		
D212	1N4148		
D214	Z, 5.1v		

PART: CD9600 **DESC : Color Display**

Main Board Vertical Deflection Circuit

IC301	TDA1675A	D306	1N4148
Q304	2SC2236	D307	1N4002, FR104
Q305	2SA966	D309	1N4148
Q306	2SC945/1815		

Main Board Power Supply & Saving

IC101	CS3842A	D103	PR1002
IC102	TL431	D104	31DF2
IC103	4N35T	D105	31DF4
IC104	WT8048	D106	31DF4
IC105	7805	D107	31DF4
IC402	7812	D108	31DF4
Q101	2SK1404	D109	31DF4
Q102	2SB861	D114	1N4148
Q103	2SC2235	D115	1N4148
Q104	2SB861	D116	1N4148
Q105	2SC2235	D117	FR104
Q106	TIP42C	D118	1N4148
Q107	2SC1213A	D119	1N4148
Q110	2SC945/1815	T101	40Mh, 34504000844
BD101	PB405	T102	34504000844
D101	FR157	FS101	3.0A,250V

Video Board

IC401	LM1203	Q413	BF423
Q404	2SC1906	Q414	BF423
Q405	2SC1906	Q415	BF423
Q406	2SC1906	D401	1N4148
Q407	KSC3953	D402	1N4148
Q408	KSC3953	D403	1N4148
Q409	KSC3953	D404	1N4148
Q410	BF422	D405	1N4148
Q411	BF422	D406	1N4148
Q412	BF422		

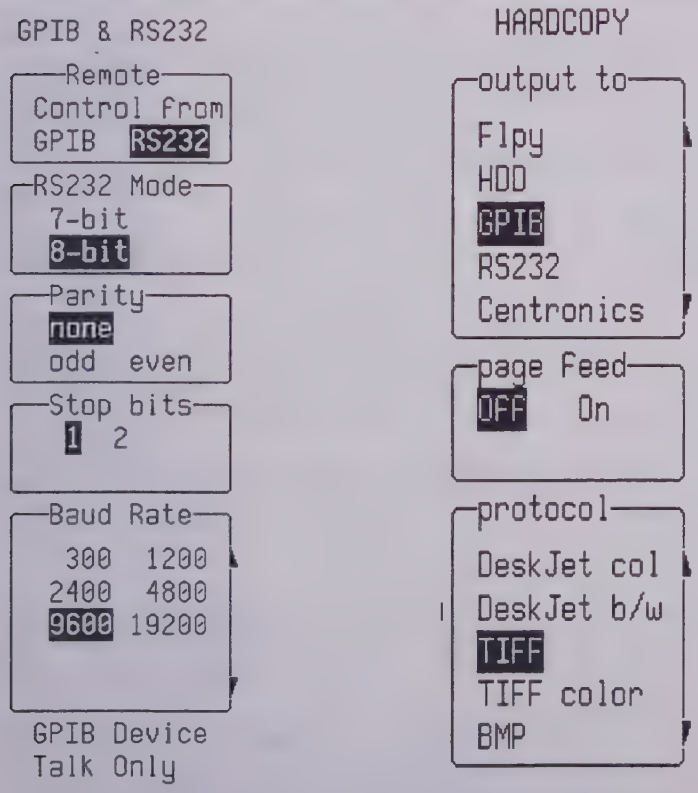
10. Connecting the LC574A

10.1 Introduction

LeCroy oscilloscopes are supplied with a list of plotters and printers known to work with them.
This list is not final, so any suggestions are welcome.

HP plotter responses to some RS-232 configuration commands have been evolved.
Consequently, the LC574A generation DSO support HP plotters of two types, 7470A and 7550A. The only difference lies in the RS-232 initialization codes. They may however, despite these changes, work with HPGL compatible plotters from other manufacturers. If the HPGL data is used as input for a CAD or word processing system, it might be necessary to remove the data preceding the in command.

Before connecting a plotter to a LC574A, do not forget to select the appropriate settings in the printer setup menu and the GPIB & RS-232 setup menu.



RS-232 connection

The following settings are assumed for the scope.

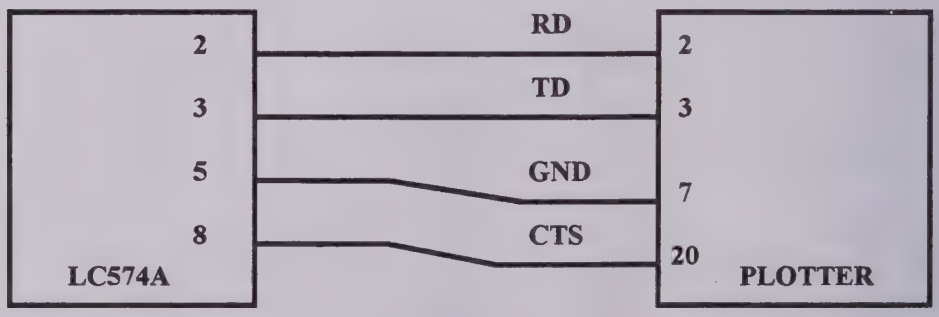
Baud rate	:	9600
Character	:	8 bits
Parity	:	none
Stop bits	:	1

Any exceptions will be mentioned.

RS 232 interface

Pin	1	:	DCD
	2	:	RD
	3	:	TD
	4	:	DTR
	5	:	GND
	6	:	DSR
	7	:	RTS
	8	:	CTS
	9	:	RI

A cable with the following pin out can be used in almost every case:



The cable has D25 connector with male pins on the plotter side, and a D9 connector with female pins on the LC574A oscilloscope side.

GPIB Connection

To have a plot done through GPIB initiated with the front panel screen dump push button, you must set the LC574A in talk only mode by selecting remote control from RS-232, and the plotter in listen only mode.
If a computer controls the GPIB Bus, both the scope and the plotter must be set in addressed mode (remote control from GPIB).
Remark: the listen only mode does not work on some old HP plotters such as HP7585B or HP7475. The plotter must be set to listener before being able to receive any commands, which is a violation of the GPIB standard.

10.2 Plotters

10.2.1 HP 7470A Plotter

Switch settings:

- RS-232 Connection:
  - S1 and S2 : 0 0
  - Y/D : D
  - A4/US : User selectable
  - B4 to B1 : 1 0 1 0
- GPIB listen only:
  - A4/US : User selectable
  - 16 to 1 : 1 1 1 1 1
- GPIB Addressed:
  - A4/US : User selectable
  - 16 to 1 : 0 0 1 1 1

10.2.2 HP 7550A Plotter

Responses to some ESC characters commands are not the same in this plotter as in older HP models like the 7470A. In fact, ESC sequences of commands which give excellent results in the 7470A can prevent any handshake in RS-232. Problems of this kind have been reported in the case of ESC.R and ESC.@ commands. When combined with ESC.I and ESC.N, ESC.@ breaks up all handshakes.

RS-232 configuration:

- Enter into display 5 (HP-IB MONITOR...).
- Select STANDARD OF STANDARD/ENHANCED.
- Enter into SERIAL sub-menu (display 6)
- For DATA_FLOW, select REMOTE. Either STANDALONE or EAVESDROP may be chosen.
- Enter into display 7 (DUPLEX, PARITY, BAUD).
- Select FULL duplex.
- Configuration PARITY and BAUD rate to the same values as on the DSO.

Do not start a plot while a sheet of paper is being loaded!

GPIB configuration:

If the scope is in TALK ONLY, the plotter must be in LISTEN ONLY.
Selection will be done at display 5.
Note : Its seems that the plotter must be powered off, then on again, to take any configuration change into account.

10.2.3 Hitachi 672 Graph Plotter (or NSA 672)

As this plotter is compatible with the 7470A, select this mode on the plotter menu page.
Switch settings

- RS-232 Connection:

Sw. A, 1 and 2	:1 1 (ISO A3) or (ISO A4).
Sw. A, 3 to 8	:1 0 1 1 0 1
Sw. B	:1 1 1 1

Note : When switches are set to ISO A4, the pen must be manually repositioned at the top of the page (or plotter reset by powering it off and on) before loading a new sheet of paper.

10.3 Printers

Interfacing is possible through RS-232, GPIB and Centronics.

10.3.1 Centronics Printers

Most printers use a Centronics parallel connection which makes direct connection possible to the LC574A using the F9300-6 Centronics interface board. If a serial to parallel converter is used, in the printer setup menu select device type Epson, and remote control from RS-232.

RS-232 Remote control port settings:
Baud rate : 9600 or 19200
Characters length (bits): 8
Parity : none
Number of stop bits : 1

The following printers and printer switch positions have been tested via serial to parallel adapter.

	Switch 1	Switch 2
1. Epson LQ-1000	1, 2, 3, 4 : ON	2, 6, 7 : ON
2. Diconix 150P	1 : ON	2, 6, 7 : ON
3. HP-ThinkJet 2225C	2, 4, 5 : ON	
4. HP-DeskJet 550 C	all down	6 up for 19200 bauds

Note: all Epson and Epson Compatible printers are likely to work if the switches are set properly, (Some experimentation may be required).

Some available serial to parallel converters need power through the RS-232 lines. Do not use them, as we do not guarantee that the serial port is able to furnish enough power.

10.3.2 RS-232 Printers

10.3.2.1 Epson FX80

It is possible to use the standard RS-232 cable. Such a printer has the optional RS-232 interface " #8143 " installed. The configuration that follows is valid for the default scope setting. The standard cable is usable.

In the particular case of an FX850:

- the main switches SW1 SW2 remain at the factory configuration

SW1	:	1	2	3	4	5	6	7	8
		OFF	OFF	ON	OFF	OFF	ON	ON	ON
SW2	:	1	2	3	4				
		ON	OFF	OFF	OFF				

- the 8143 switches are set to:

1	2	3	4	5	6	7	8
ON	OFF	OFF	OFF	n/a	OFF	OFF	ON

- the 8143 jumpers remain at the factory settings:

J1	J2	J3	J4	J5	JC	JNOR	JRVE	JF	JX
OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF

Note: Epson printers only support XON/XOFF support handshake if they have a print buffer. Such printer are : FX, FX+, JX-80, LQ-800/1000, EX-800 and LQ-25000. Otherwise, use DTR/RTS handshake.

10.3.2.2 Citizen 120D

To use this printer with the default RS-232 setting and default printer setting of the LC574A, select the following switch configuration:

DIP switch bank 1 : all OFF except 3 and 8
DIP switch bank 2 : all OFF.

10.3.2.3 HP LaserJet

Make sure that page feed is ON in the plotter menu to use the LaserJet. It is advisable to start out in single density with a size of A5. Then, depending upon the internal buffer size on the LaserJet, the image size and/or density can be increased. At one point, the internal buffer size of the DSO is also reached. The image is simply truncated, indicating that either density or size have to be reduced.

10.3.2.4 HP ThinkJet

To use printer with the default RS-232 setting and with the default cable select the following switch configuration:

- Mode switch:

1 2 3 4		5 6 7 8
0 0 0 0	: 11" page length	0 0 0 0
1	: 12" page length	

- RS-232 switch:

1	2 3	4 5
1	0 0	0 0
(use DTR handshake)	(8bits, parity none)	(9600 bauds)

Note : it may be possible that old ThinkJet recognize only the Epson protocol. If it is the case use the Epson.

10.3.2.5 HP DeskJet 550C

The standard cable is usable. The printer has been tested at 19200 bauds with the following configuration :

Switch 1 or Bank A : all down

Switch 2 or Bank B : 6 up for 19200 bauds, all the other down

10.3.2.6 Brother Printers

The Brother M-1509 and M-1709 have been tested with a serial connection. On the oscilloscope select "Epson FX-80 or compatible printer".

The switch settings are identical for both the printers:

- SW1 :	1	2	3	4	5	6	7	8
	ON	ON	ON	OFF	ON	n/a	n/a	ON

- SW1 :	1	2	3	4	5	6	7	8
	←		ALL OFF			→		

- SW1 :	1	2	3	4	5	6	7	8
	OFF	OFF	OFF	OFF	11" : OFF 12" : ON	OFF	ON	OFF

10.3.3 GPIB Printers

10.3.3.1 HP QuietJet

Make sure the dip switches on the backplane of the printer are set to

- SRQ enable: 0

- GPIB listen only:
  Listen always: 1
  A5 to A1: 0 0 1 1 1

- GPIB Addressed:
  Listen always: 0
  A5 to A1: 0 0 1 1 1

10.3.3.2 HP ThinkJet (HP 2225A)

Make sure the dip switches on the backplane of the printer are set to

- SRQ Enable: 0
- GPIB listen only:
  Listen always 1
  A5 to A1: 0 0 1 1 1

- GPIB Addressed:
  Listen always: 0
  A5 to A1: 0 0 1 1 1

10.3.3.3 HP PaintJet (black/white only)

Make sure the dip switches near the GPIB connector are set to:

- GPIB Listen only:

NORM/SCS:	NORM
A3 to A1:	1 1 1
PC8/ROM8:	N/A
ENG/MET:	has to match paper size ENG = 11" MET = 12"

- GPIB addressed:

NORM/SCS:	NORM
A3 to A1:	any combination except 1 1 1(correspond to add. 0-6)
PC8/ROM8:	N/A
ENG/MET:	has to match paper size ENG = 11" MET = 12"

10.4 Information on GPIB

10.4.1 Introduction

This section is a simple description of the GPIB interface as an aid to understanding the interface in the LC574A DSO: it is not intended as a complete specification of the system.

The GPIB system is designed for the interaction of a number of devices, which may transmit or receive information as required. The system includes data lines over which the actual data are sent, bus management lines for control, and handshake lines to ensure correct acceptance of data at the right destination.

The main features of the bus are summarized below:

Maximum number of devices	15	
Maximum bus length	20 meters or 2 meters per device, whichever is less.	
Connection	star or chain	

Note that more than half of any connected devices must be powered up, even if they will not be used.

Data lines	8 DIO	1 to 8
Handshake lines	DAV	Data available
	NRFD	Not ready for data
	NDAC	not data accepted
Bus management lines	EOI	End or identity
	IFC	Interface clear
	SRQ	Service request
	ATN	Attention
	REN	Remote enable
Active level	+0.4 V	
Inactive level	+3,3 V	

Note that all signal lines are active low, and that they are wire 0Red to allow participation by all devices.
In addition, there are 8 ground lines, making a total of 24 lines.

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